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Son illərdə D vitaminin çoxsaylı fizioloji proseslərdə iştirakı haqqında elmi tədqiqatlar dərc olunub. D vitaminin aktiv forması [1,25 dioksivitamin D ($1,25 (OH)_2$)] kalsiumun homeostazında, immun sistemin, mədəaltı vəzinin Langerhans adacıqlarının beta-hüceyrələrinin, ürək-damar və əzələ sistemlərinin fəaliyyətinin, beyin funksional aktivliyinin tənzimində iştirak edir.

$1,25(OH)_2 D_3$ (kalsitriol) bağırsaqda kalsiumun sorulmasında, skelet sümüklərinin formalaşmasında, hüceyrə tsiklinin requlyasiyasında, hüceyrə proliferasiyasının tormozlaşmasında, makrofaqların funksiyasının stimulyasiyasında, antimikrob peptidlərin sintezində, insulinin ifrazında, renin angiotenzin sisteminin requlyasiyasında, qan laxtalanmasında, ürək əzələsinin fəaliyyətində, skelet əzələlərinin inkişafında rolu vardır.

D vitamini reproduktiv funksiyanın formalaşmasında iştirak edir, bu vitaminin çatışmazlığı aybaşı pozulmalarında, ginekoloji-endokrinoloji xəstəliklərin yaranmasında rolu vardır.

Aparılan elmi tədqiqatlara əsasən ABŞ-da əhalinin 1/3 hissəsində D vitaminin defisiti ($<20\text{ng/ml}$) təyin edilib. Son 10-15 ildə ABŞ-da cinsi yetişkənlik dövründə olan qızlar arasında D vitamini çatışmazlığı 4 dəfə artıb.

Səbəbi aydın olmayan sonsuzluqların 15-30%-də D vitamini defisiti aşkar edilib.

Qan serumunda D vitaminin səviyyəsinin 20-30 ng/ml (50-70 nmol/l) olması bu vitaminin çatışmazlığı kimi qiymətləndirilir.

Ədəbiyyatda pubertat dövründə yeniyetmə qızlarda D vitamini defisitinin aybaşı funksiyasına təsiri qeyd olunur. Eyni zamanda D vitamini defisiti yeniyetmələrdə ginekoloji xəstəliklərin yaranmasında böyük əhəmiyyət kəsb edir.

D vitaminin progesterona bənzər aktivliyi və bu vitaminin defisiti olan yenitermələrdə progesteronun səviyyəsinin azalması müşahidə edilmişdir.

D vitamini defisiti ilə müxtəlif ginekoloji xəstəliklər arasında əlaqə qeyd olunur, o cümlədən D vitamini defisiti ilə yumurtalıq polikistoz sindromunun (YPS) əlaqəsi müəyyən edilib. Bu da anovulyasiyanın və hiperandrojeniyanın (HA) klinik, biokimyəvi əlamətləri ilə, ultrasəs müayinəsində yumurtalıqların polikistoz dəyişmələri ilə özünü büruzə verir. D vitamininin defisiti ilə ovarial rezervin az olması arasında korelyasion əlaqə vardır və bu qızların 18%-də antimüller hormonunun (AMH) azalması qeyd edilir.

Tədqiqatın məqsədi: Cinsi yetişkənlik dövründə HA sindromu olan qızlarda D vitamini və karbohidrat mübadiləsinin dəyişmə xüsusiyyətlərinin öyrənilməsi olmuşdur.

Tədqiqatın material və metodları: Tədqiqata cinsi yetişkənlik dövründə olan HA sindromlu 137 qız cəlb edilmişdir, xəstələr yaşa görə 3 qrupa bölünmüşdür: 12-13 yaş ($n=27$), 14-15 yaş ($n=63$) və 16-17 yaşında ($n=47$) qızlar daxil edilmişdir. Tədqiqata cəlb edilən qızların bədən kütləsi $49,07 \pm 2,8$ (23-75) kq, boyu $156,0 \pm 0,02$ (115-171) sm olmuşdur; 75 qızda (54,7%) yüngül hirsutizm, 60-da (43,8%) orta ağırlıqlı hirsutizm, 2-də (1,5%) isə ağır hirsutizm olmuşdur. HA sindromu olan



qızlarda karbohidrat mübadiləsinin göstəriciləri təyin edilmişdir. Qlükoza və insulin acqarına və eyni zamanda HOMA və KARO indeksi aşağıdakı düstürlərlə hesablanmışdır.

$$KARO\ indeks = \frac{qlukoza\ mmol/l}{insulin\ uIU/ml}$$

KARO indeksinin 0,33-dən böyük olması fizioloji göstəriciyə, 0,33-dən kiçik olması hiperinsulinemiyaya və insulinrezistentliyə uyğun gəlir.

Qan serumunda insulinin fizioloji qatılığı 11-15 uIU/ml hesab edilir.

HOMA indeksi aşağıdakı düstürlə hesablanır.

$$HOMA\ indeks = \frac{qlukoza\ mmol/l \times insulin\ uIU/ml}{22,5}$$

HOMA indeksinin 2,5-dən az olması fizioloji göstərici, 2,5-dən çox olması insulinəzistentliyi əks etdirir.

Qan serumunda qlükozanın təyini Arxitekt 8000 cihazında (Abbot-ABŞ) fotometriya metodu ilə aparılmışdır. İnsulin Arxitekt 1000 (Abbot-ABŞ) aparatında hemolüminesseniya metodu ilə təyin edilmişdir.

Cinsi yetişkənlik dövründə HA sindromu olan qızlarda D vitamini təyini edilmişdir. Tədqiqat zamanı test üsulundan istifadə edilmişdir. Bu zaman sentrifuqadan keçirilmiş 75 mkl qan serumu dozatorla götürülür və üzərinə bufer A, bufer B mərhələli olaraq qarışdırılır. Alınmış möhtəviyyatdan 75 mkl götürülərək termostata (37°C) 10 dəq müddətində saxlanılır.

Sonra alınmış möhtəviyyatın üzərinə bufer C (75 mkl) qarışdırılıb yenidən termostatda 5 dəq müddətində saxlanılır. Son mərhələdə alınmış möhtəviyyatdan 75 mkl götürülərək D vitamini üçün nəzərdə tutulmuş testlə qarışdırılır 15 dəq müddətində test "Finecare" aparatına daxil edilir.

Tədqiqatın nəticələri və onların müzakirəsi: Cinsi yetişkənlik dövründə olan qızlarda D vitaminin (25(OH)D), qlükozanın, insulinin, hesablanmış bədən çəki indeksinin (BKİ), KARO və HOMA indekslərinin dəyişmə xüsusiyyətləri cədvəldə təqdim edilmişdir.

Cinsi yetişkənlik dövründə HA sindromu olan qızlarda D vitamini və karbohidrat mübadiləsinin göstəriciləri

Göstəricilər	Müayinə qrupları			P
	12-13 yaş (n=27)	14-15 yaş (n=63)	16-17 yaş (n=47)	
	1	2	3	
Vitamin D 25(OH)D, ng/ml	22,9 ± 1,9	17,48 ± 2,71	13,4 ± 1,83	P ₁₋₂ >0,05 P ₂₋₃ >0,05 P ₁₋₃ <0,05
Qlükoza, mmol/l	4,94 ± 0,07	5,04 ± 0,04	5,05 ± 0,05	P ₁₋₂ >0,05 P ₂₋₃ >0,05 P ₁₋₃ >0,05

İnsulin, uIU/ml	18,11 ± 1,34	17,1 ± 1,64	12,46 ± 1,12	P ₁₋₂ >0,05 P ₂₋₃ >0,05 P ₁₋₃ <0,05
BÇİ, kq/m ²	18,92 ± 0,08	19,32 ± 0,09	18,89 ± 0,06	P ₁₋₂ >0,05 P ₂₋₃ >0,05 P ₁₋₃ >0,05
KARO indeksi	0,27 ± 0,03	0,29 ± 0,02	0,41 ± 0,02	P ₁₋₂ >0,05 P ₂₋₃ <0,05 P ₁₋₃ <0,05
HOMA indeksi	3,98 ± 0,004	3,83 ± 0,003	2,8 ± 0,002	P ₁₋₂ <0,05 P ₂₋₃ <0,05 P ₁₋₃ <0,05

Cədvəldən göründüyü kimi, HA sindromu olan qızlarda cinsi yetişkənlik dövrünün dinamikasında 12-13 yaşından başlayaraq D vitaminin (25(OH)D) defisiti törənir.

16-17 yaşında D vitaminin səviyyəsinin nəzərə çarpacaq qədər azalması qeyd olunur. Qeyd etmək lazımdır ki, D vitamini defisiti olan qızlarda cinsi yetişkənlik dövrün dinamikasında HOMA indeksinin statistik dürüst azalması, KARO indeksinin isə 14-15 yaşından nəzərə çarpacaq qədər artması müəyyən edilir (P<0,05).

Beləliklə, cinsi yetişkənlik dövründə HA sindromu olan qızlarda D vitamini (25(OH)D) defisiti, hiperinsulinemiya və insulinrezistentliyə meyillik müşahidə edilir.

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FEATURES OF CHANGES IN VITAMIN D AND CARBOHYDRATE METABOLISM IN GIRLS WITH HYPERANDROGENIA SYNDROME DURING PUBERTY

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CUTANEOUS MANIFESTATIONS OF COVID-19: CASE REPORTS OF FOUR PATIENTS (Case Report)

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ABSTRACT

Introduction: COVID-19 is a viral disease and we know viral illnesses may cause different cutaneous manifestations and occasionally these manifestations have diagnostic or prognostic value. Various skin lesions have been reported since the onset of COVID-19. We aim to report here our cases.

Case report: Three cases had erythematous and scaled macular skin lesions on various body regions and one case had purpuric skin lesions on her both calfs. All lesions healed without scars.

Conclusion: Despite data about skin manifestation in COVID-19 are still limited in the literature. As this data increase, determining of cases with COVID-19 can be easier. We think our cases can contribute to the literature, especially skin lesions of our cases 1-2-3 that may be a rare form of skin manifestations because of COVID-19.

Keywords: COVID-19, cutaneous manifestations

Introduction: Early December 2019, in Wuhan, capital of the state of Hubai, China, a large number of cases of pneumonia of unknown origin began to appear (1). This disease quickly spreaded to other parts of China and even six continents. On January 3rd 2020, a new type of coronavirus family was detected from a bronchoalveolar lavage sample of a patient in Wuhan. On January 7th 2020, World Health Organization (WHO) named this virus as new type of coronavirus 2019. On February 11th 2020, WHO defined this disease as coronavirus disease 2019 (COVID-19) (2,3). COVID-19 is a viral disease and we know viral illnesses may cause different cutaneous manifestations and occasionally these manifestations have diagnostic or prognostic value. Various skin lesions have been reported since the onset of COVID-19 (4). We aim to report here our cases.

Case report:

Case 1

A 36 year-old woman without additional disease, presented to the COVID-19 outpatient clinic with severe headache, arthralgia and myalgia. COVID-19, tested with naso-pharyngeal swab, was

positive. Laboratory examination conducted revealed mild increase in C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR). Chest CT was negative for pneumonia. After one week, an erythematous, scaled, about 1*1 cm macular lesion appeared on the external surface of the wrist (figure 1). Complete remission of the lesion was observed approximately two weeks after the beginning of the clinical picture.



Figure 1. Erythematous, scaled macule on the wrist

Case 2

A 24 year-old woman with hypothyroidism, applied to infectious diseases outpatient clinic because she had a history of close contact with a COVID-19 patient who was her brother. She didn't have any clinical complaints. Naso-pharyngeal swab tested for SARS-CoV-2 RNA amplification were positive. D-dimer was 720 µg/L (normal range 0 – 490 µg/L) and mild increase in WBC was determined. Chest CT was negative for pneumonia. She was examined by dermatology outpatient clinic because of erythematous, scaled, impetiginised macular lesions on her ear, chin, arm and back of the hand which begun approximately five days ago (figure 2,3). Complete remission of the lesions was observed four three after the beginning of the clinical picture.



Figure 2. erythematous,scaled macule on the chin



Figure 3. erythematous,scaled macule on the arm

Case 3

Thirty year-old Case 3 was the husband of Case 2, applied to infectious diseases outpatient clinic because he had a history of close contact with a COVID-19 patient who was the brother of his wife. He didn't have any clinical complaints. Naso-pharyngeal swab tested for SARS-CoV-2 RNA amplification were positive. Laboratory examination was normal and chest CT was negative for pneumonia. He was examined by dermatology outpatient clinic because of erythematous and scaled macular lesions on his face, both of the back of his hands which started approximately one week ago (figure 4,5). Complete remission of the lesions was observed approximately three weeks after the beginning of the clinical picture.



Figure 4. erythematous,scaled macules on the face



Figure 5. erythematous, scaled macule on the back of the hand

Case 4

A 82 year-old woman who was in-patient in the unit of infectious diseases because of COVID-19, was examined by dermatology unit. She had purpuric macular lesions on her both legs (figure 6). D-dimer was 990 $\mu\text{g/L}$ (normal range 0 – 490 $\mu\text{g/L}$), fibrinogen was 475.4 mg/dL (normal range 170 – 420 mg/dL) and mild increase in CRP was determined. Prothrombin time (PT) and activated partial thromboplastin time (aPTT) were in normal range. Signs of pneumonia were found on the chest CT. She had fever and shortness of breath. We learned that skin lesions occurred ten days after diagnosis of COVID-19. Her purpuric lesions healed completely three weeks after the beginning of the cutaneous manifestations.



Figure 6. purpuric macules on both legs



Discussion: COVID-19 causing various diseases in the body may reveal different cutaneous manifestations. Skin lesions of COVID-19 may help clinicians to identify carriers or patients and so COVID-19-specific care to these individuals can be provided earlier (5). The first report of cutaneous involvement was published in a study by Guan et al. (6) in China, which included skin rash development in 2 (0.2%) patients out of 1,099 confirmed cases of COVID-19. Acral lesions, urticarial rashes, vesicular rashes, erythematous maculopapular rashes, vascular lesions within the spectrum of livedo/purpura/necrosis, and erythema multiforme-like eruptions are the most commonly reported cutaneous symptoms of COVID-19 (5). Our three cases had erythematous, scaly, macular rashes and one case had purpuric lesions. In a review mentioned 34 relevant articles which consisted of 563 COVID-19 patients with cutaneous findings, most common skin lesions were determined as perifollicular, pityriasis rosea like, erythema elevatum diutinum like, erythema multiforme like eruptions (n=183), urticarial rash (n=104), Chilblains-like lesions (n=73), vesicular lesions (n=64), Erythematous rash (n=59), Petechiae, purpura, acroischemia, livedo, necrosis (n=43), maculopapular rash (n=14), acral lesions (n=7), herpes simplex virus activation (n=3), panniculitis (n=3), Grover disease-like lesions (n=1), pruritic red yellow confluent papules on heels (nonspecified) (n=1), chickenpox-like vesicle on trunk (n=1), mottling (n=1) (7). As can be seen, the incidence of cutaneous manifestations changes in different researches. In addition, development time of lesions were highly varied in reports (7). In our case series, two patients had skin lesions before diagnosis and two cases after diagnosis of COVID-19.

In the literature, purpuric lesions are in the list of most common skin lesions because of COVID-19 (5,7) and our one case had purpuric skin lesions on her both calfs. Skin lesions of our cases 1-2-3 were similar. Interestingly, in the literature, we didn't found similar skin lesions of our cases 1-2-3. We think these cutaneous manifestations can be a rare variant of skin lesions because of COVID-19. Despite data about skin manifestation in COVID-19 are still limited in the literature. As this data increase, determining of cases with COVID-19 can be easier (5).

In conclusion, we think our cases can contribute to the literature, especially skin lesions of our cases 1-2-3 that may be a rare form of skin manifestations because of COVID-19.

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POST COVID-19 NEUROLOGICAL SYNDROME (PCNS) IN AN 11 YEARS OLD BOY, A CASE REPORT

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ABSTRACT

By now more than 92.6^[1] persons have been reported to be infected with COVID-19, of which significant part are children. Although children experience milder symptoms compared with adults at the time of the infection, cases of post-covid-19 complications have been reported^(2, 3, 4, and 5). Complications might also include the CNS, in our case with cerebellar ataxia-like and polyneuritis-like signs and symptoms.

A 13 year old boy was presented in our clinic with signs of ataxia, occasional vomiting, impaired gait, impaired patellar reflexes on the right leg, incomplete Babinski reflex on the right leg, paresis of the left facial nerve and mild hypertension. Based on the clinical appearance and the parameters that showed past COVID-19 infection, a diagnosis of Post-COVID19 Cerebellar Ataxia-like and Polyneuritis-like was made, meaning a Post Covid-19 Neurological Syndrome (PCNS). Treatment was conducted with antibiotics and immunoglobulins resulting in significant improvement in the following days.

There are few reported cases about neurological complications caused by COVID-19 in children and adolescents, without any other symptoms of the virus. This is one of the first cases of Post-COVID19 Cerebellar Ataxia and Polyneuritis in a child as a result of COVID-19 and the first case in our country.

Keywords: Post-COVID19 complications, Post Covid-19 Neurological Syndrome, cerebellar ataxia, polyneuropathy, children

Introduction: As inflammation is a common reaction to biological insult, many conditions may present with features of neuritis. Common causes include autoimmune diseases, infection, either bacterial or viral, post-infectious immune reaction or a response to physical injury^(6, 7).

Coronavirus disease-19 (COVID-19) is firstly a respiratory disease caused by Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2). Its pathobiology begins with targeting the angiotensin enzyme two (ACE-2) receptors which are present throughout the body, including neural tissues leading to endothelial dysfunction also at the neuro-vascular units in the brain. On-going hyperinflammation and endotheliitis contribute to the disruption of the blood-brain barrier, allowing entry of innate immune cells into the brain and further pro-inflammatory cytokine cascades⁽¹⁶⁾. COVID-19 seems to be able to promote a hypercoagulable state through unique mechanisms and cross-talks between thrombosis and inflammation^(17,18). Recent publications highlight the emerging evidence of a new syndrome- Post Covid-19 Neurological Syndrome (PCNS) with Chang and



colleagues describing patients with prolonged muscle weakness and other forms of myopathy among SARS-CoV survivors in Hongkong^[19].

Cerebellar ataxia is a form of ataxia originating in the cerebellum^[8], that can occur as a result of many diseases and may present with symptoms of an inability to coordinate balance, gait, extremity and eye movements.^[9] Lesions to the cerebellum can cause dyssynergia, dysmetria, dysdiadochokinesia, dysarthria and ataxia of stance and gait.^[10]

Polyneuropathy is damage or disease affecting peripheral nerves (peripheral neuropathy) in roughly the same areas on both sides of the body, featuring weakness, numbness, and burning pain.^[11]

These two entities may develop as a post-infectious consequence that often presents itself several weeks after the resolution of the acute infection. In our case report they are both result from an asymptomatic COVID-19 infection.

Case report: We present an 11 years old boy who referred to our clinic because of headache, hypertension, muscle weakness and muscle pain, and impaired walk. The present disease started one week before. Medical history showed a dysphonic speech from the age of six, treated with speech occupying therapy.

On admission he was conscious, afebrile and with gait disturbance with slight right-sided hemiparetic gait. During neurological examination verbal and visual contact was established, had dysarthric speech, no dysmetria, tandem gait was impossible to assess, negative Romberg test, Gowers test impossible to execute, cranial nerve examination revealed paresis of the left peripheral facial nerve, muscular tone was normal, muscular strength was normal in the left limbs while it was slightly reduced in the right limbs, tendon reflexes were preserved in the upper limbs with a hypoactivity in the lower limbs more designated on the right limb and positive incomplete Babinski sign on the right, superficial sensibility was preserved while deep sensibility for space was impaired, pathological involuntary movements were not observed and there were no meningeal signs.

Laboratory evaluation and diagnostic procedures were performed. Initial laboratory tests such as CBC, CRP, basic metabolic panel, lipid panel and liver panel revealed normal findings. Additional laboratory tests performed such as AFP level was with normal value, c-ANCA, ANA, Anti dsDNA were not found in serum, IEP serum test revealed normal results (Table 1 and Table 2).

Table 1: Laboratory values in blood

Blood	Value	Reference value
White blood cells (WBC)	5.06	$3.5 - 10 \times 10^3/\mu\text{L}$
Platelets (PLT)	254	$150 - 400 \times 10^3/\mu\text{L}$
Red blood cells (RBC)	5.24	$3.5 - 5.2 \times 10^6/\mu\text{L}$
CRP	< 0.2	0 – 5 mg/L
Glucose	5.97	4.1 – 5.9 mmol/l
Iron	24.1	6.6 – 26 $\mu\text{mol/l}$
Feritin	103	30 – 400 $\mu\text{g/l}$
Transferin	300.34	130 – 360 mg/dl
AST	22	15-59 U/L
ALT	6	9 – 72 U/L
GGT	15	0 – 36 U/L
LDH	183	0 – 500 U/L
Total Bilirubin	10.7	3 – 22 $\mu\text{mol/L}$

Direct Bilirubin	5.1	0 – 5 umol/L
Amylase	133	25 – 125 U/L
Lipase	23	8 – 78 U/L
Urea	5.2	2.6 – 6.4 mmol/L
Creatinin	63	0 – 104 umol/L
Albumin	46	40- 49 g/L
Total proteins	69	64 – 83 g/L
CK	69	29 – 200 U/L
CKMB	24.66	0 – 24 U/L
IgA	1.12	0.63 – 4.84 g/L
IgM	1.19	0.22 – 2.93 g/L
IgG	8.19	5.40 – 18.22 g/L
Total T3	169	82 – 179 ng/dL
TSH	0.969	0.4 – 4.0 uIU/mL
Total T4	10.7	4.5 – 12.5 ug/dL
Triglycerides	0.59	0 – 2.3 mmol/L
Cholesterol	3.64	0 – 5.2 mmol/L
UHDL	1.4	1.04 – 1.55 mmol/L
DLDL	2.28	2.59 – 4.11 mmol/L
Lactate	2.11	0.5 – 2.2 mmol/L
Sodium	136	135 – 145 mmol/L
Potassium	3.79	3.6 – 5.2 mmol/L
Ionised Calcium	1.21	1.15 – 1.30 mmol/L
Chloride	101	96 – 106 mmol/L
Vitamine B12	294	187 – 883 pg/mL
Uric acid	346	155 – 480 umol/L
D-dimer	1962	0 – 500 ng/mL
Prothrombin time (PT)	14.7	9.8 – 14.2 s
Activated partial thromboplastin time (aPTT)	29.6	27.9 – 37.7 s
Thrombin time	17.9	16.1 – 24.1 s

Table 2: Antibodies in blood

Antibodies (Blood) *	Value	Reference value
antiCCP	negative	< 25 IU/ml
ANA-Hep2(IFA)	negative	
antidsDNA	negative	< 55 IU/ml
Anti-Sm	negative	< 25 U/ml
c-ANCA	negative	< 5.0 U/ml
ACL-IgG	negative	< 10 U/ml
antiSSA	negative	< 12.5 U/ml
antiSSB	negative	< 12.5 U/ml



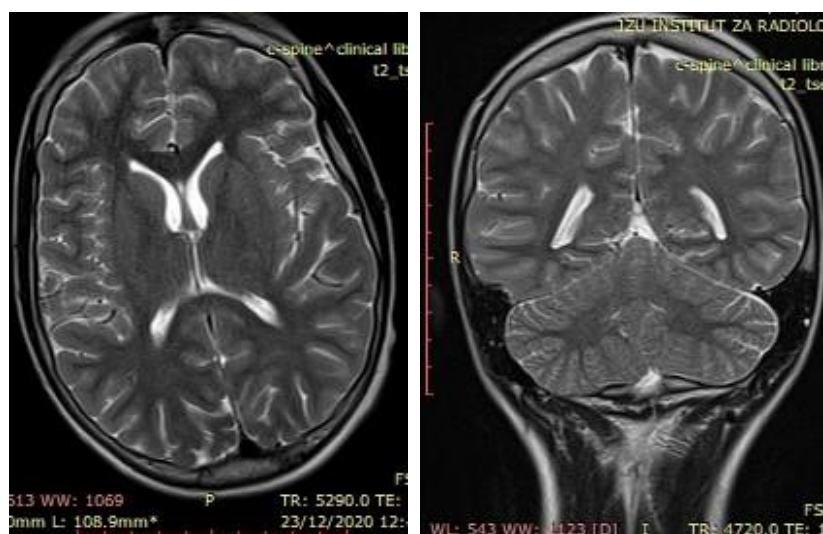
antiScl-70	negative	< 12.5 U/ml
AFA	negative	< 15 U/ml
ACLA IgM	negative	

AntiCCP = anti cyclic citrullinated peptide; ANA-Hep2(IFA) = Anti-Nuclear Antibodies HEp-2(indirect fluorescence assay); antidsDNA =_anti-double stranded DNA; Anti-Sm= Anti-Smith antibodies; c-ANCA= antineutrophil cytoplasmic antibodies; ACL-IgG= Anti-cardiolipin autoantibodies- IgG; antiSSA= anti-Sjögren's-syndrome-related antigen A autoantibodies; antiSSB= Anti-Sjögren's syndrome type B (SSB) antibodies; antiScl-70= Autoantibodies against topoisomerase I; AFA= anti-fibrillarin antibodies; ACLA IgM= IgM anticardiolipin antibodies.

Abdominal ultrasound, chest X-ray, fundoscopic examination, brain CT scan and brain and spinal cord MRI revealed normal findings (Picture 1 and Picture 2). Electroencephalography (EEG) activity was normal, no epileptic activity nor cerebral dysfunction was recorded in the tracing (Picture 3). EMNG revealed normal findings.

Picture 1: T1W, T2W and FLAIR Brain MRI sample images

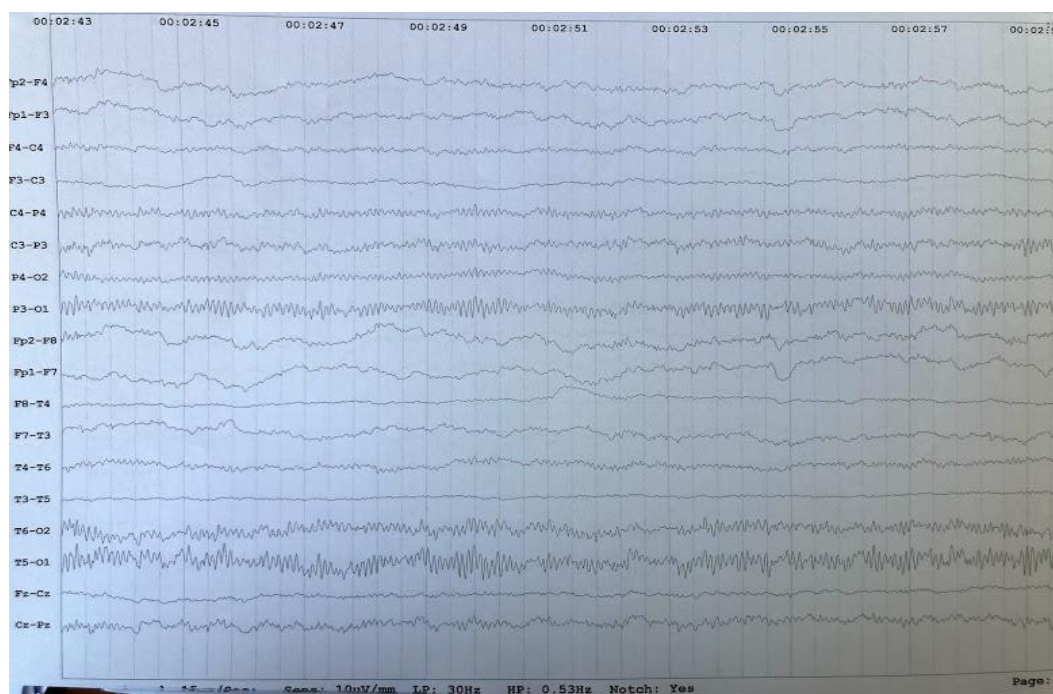




Picture 2: T1W and T2W cervical spinal cord MRI sample images



Picture 3: EEG sample of the patient



Lumbar puncture was done (Table 3) and electrophoretic separation of CSF proteins (Table 4) showed a total proteins content of 3.79 g/l, albumin content of 3260 mg/l and Immunoglobulin: IgG of 237 mg/l with a IgG index of $0,3 \times 10^3$ and IgG synthesis in CNS was 0 mg/24 h. According to the characteristics of the electrophoregram there is an immunological activity in the brain that corresponds to dysfunction of the hemathoencephalitic barrier with stressed compressive characteristics.

Table 3: Laboratory values in CSF

CSF	Value	Reference value
Appearance	Clear	clear
Glucose	4.4	2.7 – 4.1 mmol/L
Red blood cells	0	0
White blood cells	0	0 – 6 x 10 ⁶ /L
Protein	3.79	0.15 – 0.45 g/L
Albumin	3260	50 – 250 mg/L
Albumin coefficient	59.50	0.8 – 7.4 x 10 ³
IgG	237	3 – 30 mg/L

IgG index	0.3	0.1 – 0.7 x 10 ³
Chloride	134	116 – 127 mmol/l
Lactate	1.9	1.1 – 2.4 mmol/l

Table 4: Electrophoregram

CSF	Results	Value ranges
Total proteins (g/l)	3.79	0.15-045
Albumins(mg/l)	3260	50-250
IgG(mg/l)	237	3-30
Albumins coefficient (10 ³)	59.5	1.8-7.4
IgG index (10 ³)	0.3	<0.7
IgG synthesis in CNS (mg/24h)	0	<5

Two days after the admission ataxic gait was observed and a positive Romberg test with falling to the right.

Regarding hypertension pediatric cardiologist, nephrologist and endocrinologist were consulted. Renal artery Doppler ultrasound showed normal findings. 24 h Holter monitoring was done, which revealed normal findings. All laboratory findings were in normal range (Table 5). The hypertension was treated with antihypertensive drugs and it was stabilized in a few days.

Table 5: Laboratory values in urine

Urine	Value	Reference value
Metanephrin	1.0	< 5.5 umol/day (U)
Vanilmandelic acid (VMA)	14.6	7.0 – 68 umol/day (U)
Diuresis	1.7 L	0.8 – 1.5 L
Amylase	291	24-400 U/L



The findings from the COVID-19 specific IgG showed an elevated range of 52.59 AU/ml (Table 6).

	Value	Reference value
COVID-19 RBD (Receptor-Binding Domain) IgG	52.59	< 1.00 AU/mL

Treatment was implemented with intravenous immunoglobulins during five days with a dose of 400 mg/kg bw/day. He made a dramatic improvement over the next few days and was able to walk well and was fully recovered at the end of the second week.

Discussion: There are very few cases in the children and adolescents who have experienced neurological post COVID-19 complications. Our report is among the rarest with cerebellar ataxia-like and polyneuritis -like signs symptoms.

The affected child had no history of change or loss of taste and smell, nor the other specific COVID-19 symptoms. The only proof of past infections were the elevated COVID-19 specific IgG.

The results from the foregram with elevated proteins and immunoglobulins were indicating Guillain Barre Syndrome and electromyoneurographic findings were normal, but the clinical signs were indicating polyneuropathy.

Other possible infections which might give these neurological sign and symptoms were excluded with normal findings.

Conclusion: Although common symptoms of COVID-19 in children are cough and fever, it is important to note, however, that these symptoms may not always be present ^[12, 13, 14] or they may go unnoticed. The vast majority of reported infections in children are mild or asymptomatic, with few recorded childhood fatalities attributed to covid-19 ^(2, 3, 4, and 5). Additionally, there are few cases in pediatric population where post-COVID-19 complications emerge and need in-patient treatment. Currently, as we are still experiencing the pandemic and its effects, it is too early to describe the full clinical picture of PCNS. However, we believe published evidence has already made an undeniable case for medicine to recognize the increasing numbers of ex-patients with Post COVID Neurological Syndrome (PCNS) and the need for on-going neurological and cognitive/affective monitoring of all cases of COVID-19 (irrespective of the severity from asymptomatic, mild to severe) for PCNS ^(15,16).

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DƏMİR METABOLİZMI İLƏ TIP 2 ŞƏKƏRLİ DIABETİN BÖYRƏK AĞIRLAŞMALARI ARASINDA QARŞILIQLI ƏLAQƏ

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ABSTRACT

There is a strong connection between iron metabolism and glucose exchange. This connection is mutual. On the one hand, iron excess cause insulin resistance. On the other hand, hyperglycemia leads to hyperferritinemia. Hyperferritinemia complicates course of Type 2 diabetes and ground early occurrence of complications. Based on given research results 32.14% of diabetic nephropathy patients with high ferritin and 6.25% of diabetic nephropathy patients with normal ferritin were on level 5 (chronic kidney disease level) of diabetic nephropathy. Iron metabolism has significant effect on glucose exchange. Targeting Iron stores should be consider in prevention of Type 2 Diabetes Mellitus and treatment of patients with Type 2 Diabetes Mellitus.

Keywords: Diabetes Mellitus, Insulin Resistance, Iron, Ferritin

XÜLASƏ

Dəmir metabolizmi ilə qlukoza mübadiləsi arasında sıx qarşılıqlı əlaqə var. Bu əlaqə ikitərəfli xarakter daşıyır. Bir tərəfdən dəmir artıqlığı insulin rezistentliyinə səbəb olur. Digər tərəfdən hiperqlikemiya hiperferritinemiya gətirib çıxarır. Hiperferritinemiya tip 2 Şəkərli diabetin gedişini ağırlaşdırır və ağırlaşmaların erkən meydana çıxmasına səbəb olur. Tədqiqatımızın nəticələrinə görə zərdab ferritini yüksək olan diabetik nefropatiyalı xəstələrin 32,14% və zərdab ferritini normada olan diabetik nefropatiyalı xəstələrin 6,25% diabetik nefropatiya 5 mərhələdə - xroniki böyrək yetməzliyi mərhələsində idi. Dəmir metabolizminin qlukoza mübadiləsinə olduqca önəmli təsiri var. Tip 2 Şəkərli Diabetin önlənməsində və tip 2 Şəkərli Diabeti olan xəstələrin müalicəsində dəmir depolarının hədəfə alınması düşünülməlidir.

Açar sözlər: Şəkərli diabet; insulinə rezistentlik; dəmir; ferritin;

Problemin aktuallığı: Əsrlər boyudur Dəmir metabolizmi ilə qlukoza homeostazı arasındakı qarşılıqlı əlaqə tədqiqatçıların maraq dairəsindədir (1). İlk dəfə olaraq IX əsrdə Appolinaire Bouchardat “bronze diabetes” terminini istifadə edib. Məlum olduğu kimi bu termin hemoxromatoz xəstəliyinə aid olan bir termindir. Maraqlı bir faktdır ki, ilk dəfə “İnsulin rezistentliyi” termini də məhz bu xəstələrə aid istifadə olunub. 1929-cu ildə Howard Root bu xəstələrdə insulinə qeyri-adi yüksək doza tələbatı aşkarladı və bu vəziyyəti “İnsulin rezistentliyi” adlandırdı (2).

Son illər dəmir mübadiləsində iştirak edən tənzimləyici zülalların kəşfi ilə əlaqədar insan orqanizmində dəmir metabolizminə dair yeni məlumatlar əldə olunub (3, 4, 5). Məlumdur ki, dəmir oksigenlə zəngin mühitdə yaşayan orqanizmlərin həyat fəaliyyətlərində ən mühüm elementlərdən biridir. Güclü oksidləşdirici-reduksiyaedici xüsusiyyətlərə malik dəmir Hb vasitəsilə oksigen daşınması, DRN turşularının sintezi, mitoxondrial fermentlərin işi üçün vacibdir. Dəyişən valentli metal olaraq dəmir katalaza, peroksidaza, sitoxrom kimi qeyri-hem enzimlərin

tərkibində oksigenin aktiv formalarını neytrallaşdırır. Lakin, dəmirin 3 valentli pulunun artması sərbəst radikalın əmələ gəlməsi üçün karalizator rolu oynaya və oksidativ stresin inisiatoru ola bilər. Kompensasiya məqsədilə orqanizmdə təbii antioksidantlar- 3 valentli dəmir xelatorları var ki, bunlara da sidik turşusu, seruloplazmin, superoksiddismutaza, ferritin, transferrin aiddir.

Normada insan orqanizmində 3-4 q dəmir olur (40-50 mq Fe/kq). Bu mikroelementə sutkalıq tələbat kişilərdə 10 mq, reproduktiv dövr qadınlarda 20 mq-dır. Bunun yalnız 1-2 mq-ı bağırsaqlardan sorulur və eyni qədər də mədə-bağırsaq traktının büzüşmüş epiteli, epidermis, tər və sidiklə xaric olur. Dəmirə olan gündəlik tələbatın əsas hissəsi retikuloendotelial sistemdən (dalaq, qaraciyər, sümük ilişi) daxil olur. Dəmirin sorulması 12 barmaq bağırsaqda və nazik bağırsağın yuxarı hissəsində tənzimləyici zülalların ciddi nəzarəti altında baş verir.

Dəmirin hüceyrələr tərəfindən istifadə olunmayan hissəsi Ferritin və Hemosiderin şəklində qaraciyərdə, dalaqda, sümük ilişində, əzələlərdə toplanır. Ferritin – Apoferritin zülalı və ona birləşə bilən 4 minə qədər dəmir atomundan ibarət hüceyrə daxili kompleksdir. Onun 5 izoformasına var. Qaraciyər və dalaqda olan izoformalar qələvi təbiətli olub dəmirin depolaşmasına cavabdehdir. Miokard, ciyər və şiş hüceyrələrində olan turşu təbiətli izoformaları isə sintez proseslərində əlaqələndiricilərlər və T-hüceyrə immunitet cavabının rəqlulyasiyasında iştirak edir. Odur ki, Ferritin həm kəskin faza və həm də şişin böyümə zülalıdır. Hemosiderin Ferritinin həll olmayan hissəsidir.

2 valentli dəmirin enterositdən qana, həmçinin qaraciyərdən, dalağın makrofaqlarından və sümük ilişindən daşınması yeganə daşıyıcı zülal - Ferroportin vasitəsilə həyata keçirilir. 2001-ci ildə dəmir mübadiləsinin tənzimlənməsində və Ferroportinin funksiyasında mühüm rol oynayan Hepsidin kəşf olundu. 25 amin turşudan ibarət olan bu zülal qaraciyərdə və bəzi məlumatlara görə piylənməsi olanlarda piy toxumasında sintez olunur (1).

Bugünkü gün dəqiq məlumdur ki, iltihab zamanı, həmçinin şiş proseslərində xroniki iltihab anemiyasının əmələ gəlməsinin əsas səbəbi Hepsidində, onun səviyyəsinin artmasıdır. Hepsidin Ferroportinin işini bloklayaraq dəmirin zərdab konsentrasiyasına nəzarət edir. Bu halda dəmir enterositlərdə, makrofaqlarda və hepatositlərdə toplanır. Qanda dəmirin miqdarı artanda Hepsidin sintezi artır. Nəticədə resirkulyasiya və dəmirin depodan çıxması prosesləri tormozlanır.

Orqanizmin dəmirə Yüklənmə Sindromunun bir çox səbəbləri ola bilər ki, bunlardan biri də qaraciyər steatozu, abdominal piylənmə, hiperqlikemiya və İnsulin Rezistentliyi. Qlikozilləşmə hesabına Transferrinin işi korlanır, qaraciyərə Dəmirin daxil olması və Ferritin sintezi artır.

Son illərdə dəmirə qlukoza arasındakı qarşılıqlı əlaqənin öyrənilməsi iki istiqamətdə aparılır. Bir tərəfdən dəmirin insulinin sekresiyasına və aktivliyinə olan təsiri öyrənilir, digər tərəfdən isə əksinə, insulin sekresiyasının və aktivliyinin dəmir mübadiləsinə olan təsiri araşdırılır. Yəni son nəticə etibarilə məqsəd bu iki sistem arasında olan əlaqəni müəyyənləşdirmək, insulinə həssas toxumalarda və eyni zamanda insulin sekresiya edən β hüceyrələrə dəmirin təsirini tədqiq etməklə ŞD tip 2-nin etiopatogenetik mexanizmlərinə bir daha nəzər salmaq olub (1).

Məlumdur ki, qara ciyərin də sirkad ritmi var və bu sirkad ritm qlukoneogenezlə bağlıdır və onun pozulması tip 2 diabetin yaranmasının əsas səbəblərindəndir. Dəmirin toplanması qara ciyərin sirkad ritmin pozulmasına səbəb olur (7).

Yenidən tarixə qayıdaq: Yaxın 25 ildə nələr baş verib? 1997-ci ildə İlk dəfə olaraq R. Moirand və Y. Dengnier “Dəmir yüklənməsinin dismetabolik sindromu” terminini təklif etdilər (6). 1999-cu ildə M. Mendler və həmmüəllifləri İnsulin rezistentliyi və Metabolik sindromu olan xəstələrdə Dəmirə Yüklənmə Sindromunun olduğunu sübut etdilər (8). Yəni Dəmir Yüklənməsi Metabolik Sindromun bir əlaməti kimi qəbul olunur. İnsulin Rezistentliyi sindromunun “Dəmir fenotipi”



təsvir edilir. 2008-ci ildə Riva və həmmüəllifləri Dəmirlə Yüklənmə Sindromunun diaqnostik meyarlarını təklif etdilər (1).

Nəzərə almaq vacibdir ki, Dəmirlə Yüklənmə Sindromu bu pasientlərdə İnsulin rezistentliyi, Şəkərli Diabet və Ürək-Damar xəstəliklərinin yaranması və progressivləşməsi üçün risk faktorudur. Belə ki, piylənməsi olan kişilər üçün Ferritinin 400 mkq/L, reproduktiv dövr qadınlar üçün isə 300 mkq/L-dən yüksək olması İnsulin rezistentliyi markeridir (1). İltihabın inkar olunduğu hallarda Qaraciyərin qeyri-alkohol piy xəstəliyi zamanı hiperferritinemiya olduqda qlikemiyaya ciddi nəzarət lazımdır. Belə ki, bu halda Şəkərli Diabet riski 4,6 dəfə artır (1). Ferritin artmış səviyyəsi qaraciyər staetozunun prediktoru ola bilər. Bu da onu sübut edir ki, hiperferritinemiyanın səbəbi qaraciyərin qeyri-alkohol piy xəstəliyi deyil. Əksinə, piylənmə və İnsulin rezistentliyi ilə əlaqədar olan hiperferritinemiya qaraciyərin piy xəstəliyinə gətirib çıxara bilər (1).

Qaraciyərin qeyri-alkohol piy xəstəliyi zamanı Dəmirlə Yüklənmə Sindromunun inkişafına İnsulin rezistentliyi, Şəkərli Diabet və visseral piylənmə səbəb olur.

Məqsəd: Tədqiqatımızın məqsədi Şəkərli Diabeti olan xəstələrdə dəmir mübadiləsinin bəzi göstəriciləri ilə Şəkərli Diabetin ağırlıq dərəcəsi arasında əlaqəni araşdırmaq oldu. Bunun üçün tip 2 Şəkərli Diabeti olan 103 xəstə müayinə olundu. Tədqiqatın məqsədi zərdab ferritini göstəricisi ilə böyrəklərin funksional vəziyyəti arasındakı əlaqəni müəyyən etmək idi.

Material və metodlar: Tip 2 Şəkərli Diabeti olan xəstələrdə ümumklinik müayinələrlə yanaşı böyrəklərin funksional vəziyyəti, Dəmir mübadiləsi göstəriciləri (o cümlədən Ferritin) tədqiq olundu.

Müzakirə: Tədqiqata daxil olan 103 Tip 2 Şəkərli Diabeti olan xəstədən 37-də zərdab ferritini normadan yuxarı, 66-da norma daxilində idi. Əldə etdiyimiz nəticələrə görə zərdab ferritini normadan yuxarı olan 37 xəstədən 28-də (75,6%) və zərdab ferritini norma daxilində olan 66 xəstədən 32-də (48,5%) diabetik nefropatiya var idi. Zərdab ferritini yüksək olan diabetik nefropatiyalı xəstələrdən 9-da (32,14%) və zərdab ferritini normada olan diabetik nefropatiyalı xəstələrdən 2-də (6,25%) diabetik nefropatiya 5 mərhələdə (xroniki böyrək yetməzliyi mərhələsi) idi.

Böyrək yetməzliyi olan xəstələrdən 63,6 %-də diabetin davam etmə müddəti 15 ildən çox, 36,3 %-də 3 ilə qədər idi. Son qrup xəstələrdə zərdab ferritininin dəyərləri normadan yüksək idi.

Nəticə: Güman etmək olar ki, Şəkərli Diabeti olan xəstələrdə xroniki böyrək çatışmazlığının erkən təzahürünün səbəblərindən biri hiperferremiya ola bilər. Ədəbiyyatdan da məlum olduğu kimi zərdab ferritini yüksək göstəricisi ilə xroniki böyrək yetməzliyinin inkişafı arasında bilavasitə əlaqə var.

Yekun: Əldə etdiyimiz nəticələrə görə ferritinin yüksək göstəriciləri Şəkərli Diabetin gedişinə əsaslı şəkildə təsir edir. Beləliklə, hiperferritinemiya Şəkərli Diabetin gedişini ağırlaşdırır və ağırlaşmaların erkən meydana çıxmasına səbəb ola bilər. Şəkərli Diabetin olan xəstələrdə ümumklinik müayinələrlə yanaşı dəmir mübadiləsi göstəricilərinin tədqiqi, lazım olarsa, onların korreksiyası Şəkərli Diabetin gedişinə təsir edə və xroniki ağırlaşmaların qarşısının alınmasında müəyyən rol oynaya bilər.

Dəmirin qlukoza metabolizminə olduqca önəmli təsiri var və tip 2 diabeti olan xəstələrdə müalicə və tip 2 diabetin önlənməsində dəmir depolarının hədəfə alınması düşünülməlidir.

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INTERACTION BETWEEN IRON METABOLISM AND RENAL COMPLICATIONS OF TYPE 2 DIABETES MELLITUS

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ABSTRACT

There is a strong connection between iron metabolism and glucose exchange. This connection is mutual. On the one hand, iron excess cause insulin resistance. On the other hand, hyperglycemia leads to hyperferritinemia. Hyperferritinemia complicates course of Type 2 diabetes and ground early occurrence of complications. Based on given research results 32.14% of diabetic nephropathy patients with high ferritin and 6.25% of diabetic nephropathy patients with normal ferritin were on level 5 (chronic kidney disease level) of diabetic nephropathy. Iron metabolism has significant effect on glucose exchange. Targeting Iron stores should be consider in prevention of Type 2 Diabetes Mellitus and treatment of patients with Type 2 Diabetes Mellitus.

Keywords: Diabetes Mellitus, Insulin Resistance, Iron, Ferritin



KNOWLEDGE AND PRACTICES OF PERSONAL HYGIENE AMONG SCHOOL STUDENTS IN A RURAL COMMUNITY OF LAHORE

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ABSTRACT

Introduction: According to World Health Organization (WHO), "hygiene refers to conditions and practices that assistance to keep up wellbeing and avoid the spread of disease. Personal hygiene includes those practices performed by a person to care of one's bodily well-being, through cleanliness.

Methods: A Cross sectional descriptive study was conducted among the students total (n= 125) in the government high school Lahore, Pakistan from September 2019 to November 2019.

Results: The instrument use for the data collection was adopted questioner and convenient sampling technique was used. Study included 125 high school students all the students participated in the study were male 100% with their age ranged 14 years are 38%, 15 are 37%, 16 years are 13% and 17 years are 12% respectively.

More than three quarters of the children knew the requirement of personal hygiene. About two thirds of children had well to moderate knowledge with nearly three quarters had positive attitudes and more than half had good practice. There was a moderate positive correlation between knowledge score with both the attitude and practice scores.

Conclusions: From the present study conducted among high school students in Lahore it can be concluded that the percentage of hygiene practices and knowledge among high school students was satisfactory.

Keywords: Hygiene Knowledge, Practice High school students

Introduction: Personal hygiene can be defined as the practice of maintaining cleanliness and promoting the health of the body (Al-Rifaai, Al Haddad et al. 2018). The Hygiene practices are very important, poor hygiene results in different communicable diseases. Children learn hygiene practices from their childhood. Schoolchildren are mostly prone to ignore basic personal hygiene (Sharma, Sharma et al. 2018). Children learn hygiene practice from childhood, improper practices lead to numerous transmittable diseases such as skin infections, gastroenteritis, etc. According to WHO, about 3.8 million children die due to diarrhea and acute respiratory tract infection per year under the age of five (Joshi and Agarwal 2016). The level of personal hygiene has a great influence on the preventive capacity of many diseases and, therefore, it has great importance. The school is a major place for hygiene practices (Mangal, Kumar et al. 2019).

Personal hygiene, also known as personal care, includes bathing, hairs care, nails care, dental care, foot care, genital care, and laundry. Examples of these activities would be the shaving of the hair and the cutting of the nails. Health education providing to high school students can improve their personal hygiene practices (Ahmadu, Rimamchika et al. 2019). Most of the disease and death in the

world are due to communicable diseases. Within the developing countries this tendency is more common where the respiratory and intestinal infection is the main cause of morbidity and mortality in young children. Inadequate hygienic conditions and bad hygiene practices play an important role in the burden of communicable diseases. The morbidities that arise due to bad personal hygiene practices are more due to in height population density, the spread of respiratory infections, insufficient water supply, lack of health services, diarrhea and insufficient nutrition that leads to anemia, malnutrition and vitamin deficiency. Furthermore, Self-care is more important for the students because students spend most of the time outside like they spend time in school, college or universities close to others Infection transmission to students can lead to school absence, which can also disturb the academic performance (Seenivasan, Mary et al. 2016). Knowledge and health promotion are essential for children, their families, and communities in general. Indeed, a meta-analysis of hand hygiene of 30 students showed that improved handwashing minimized the onset of respiratory tract infection and gastrointestinal diseases (Temitayo 2016).

Education has positive impact on personal hygiene practices. Teaching students about personal hygiene provides them with knowledge about health, making them aware of the risk reduction associated with bad hygiene practices, such as disease transmission. Health education meant that university students could pass on personal hygiene information to their families and the community. Therefore, it leads to a better lifestyle, which can potentially increase the profile of social hygiene. The development of policies, services, and research on these issues is essential to maintain and improve the quality of health education (Sarkar 2018). A direct relationship exist between good personal hygiene and absence of diseases among school children and also decreases infant morbidity and mortality from infectious diseases (Khatoon, Sachan et al. 2017).

Germs spread in schools is dangerous for our young people's health. Good hygiene practices help prevent the spread of germs and also give a good impression of one person to others. Daily activities related to personal hygiene if practiced correctly can improve and maintain health. Communicable diseases that are transmitted through food, water, personal contact, and the surrounding environment can be adequately controlled by adopting hygienic practices (Chaudhari, Mansuri et al. 2015). Schools offer the opportunity to better educate students on different aspects of health, such as nutrition, immunization, hygiene, the environment, sanitation, social customs, etc. Early detection of childhood diseases can prevent complications in school-age children and it is possible through regular health checks (Kunde 2017).

School and family are the two main sources of strong basis for hygiene practices. The level of personal hygiene has a great influence on the preventive capacity of many diseases and, therefore, the evaluation of its level acquires great importance. This will allow children to attend schools regularly and therefore improve their academic performance (Mhaske, Khismatrao et al. 2017). Globally 9.1% of the diseases and 6.3% of the death can be prevented through clean and drinking water, sanitation, and by maintaining good hygiene. Children's who has good knowledge and practices of personal hygiene are less likely to be absent from school and get good grades. (Dajaan, Addo et al. 2018).

Aims of the study: The aim of this research is to assess the knowledge and practice of personal hygiene among school students in a rural community of Lahore.

Significance of the study: Through this study knowledge of secondary school students will improve for changing the behavior regarding personal hygiene, which ultimately promotes the



health of students. The study help to prevent students from any kind of disease and promote health status which lead to a better quality of life.

All these secondary school students belong to the community, because of changing the practice overall health will be automatically improved and all the problems in the community will be reduced. The researcher will get more knowledge regarding community and research studies. There will be a chance for the researcher to conduct further research in other communities. This will be an appreciated step in nursing education and healthcare service leading to better understanding and determining many techniques that may promote personal hygiene and influence the perceptions of secondary school students and the people of the community, about personal hygiene and the nursing profession.

Literature search: The concept of personal hygiene is more common in medical as well as in public health practices. Personal hygiene contains keeping the hygiene of our body and clothes. It is well-defined as a circumstance promoting sanitary practices to self. Knowledge of personal hygiene and practice is very important in every activity of our day. The aim of public health regarding personal hygiene contain the prevention of oro-fecal diseases, aesthetic values, and social impacts (Bastos 2016).

A study conducted by (Temitayo 2016) to explore secondary school students knowledge about personal hygiene and practices, The results of the study show that about 98.2% students had a good knowledge of personal hygiene, and could exactly identify the components and some of the harmful concerns of insufficient personal hygiene practices The results of the study also show that most of the participants had good hygiene practices, like bathing (99.6%), brushing their teeth (98.2%) and washing their hands (65.9%). Willmott and Nicholson (2016) study reveals that majority of the respondents (88.5%) had good knowledge level on personal hygiene. Female students were found having more knowledge level than male students. On the other hand, the majority of them were noted with moderate to the poor level of hygiene practices. School students have good knowledge of personal hygiene while a lot more improvement is required in terms of practices. An integrated approach by parents, school and social media could be useful to enhance hygiene practices. So it is concluded that school students have good personal hygiene knowledge and good personal hygiene practices (Willmott, Nicholson et al. 2016). Rajbhandari and his fellows conducted study which show that most of the participants had good level of knowledge of personal hygiene. In the study, it was founded that female students have more knowledge regarding personal hygiene as compare to male students. But the practices were very low. (Rajbhandari, Dhaubanjari et al. 2018). According to a study results indicate that insufficient and generalized hand hygiene in the school population. Furthermore, low scores related to the knowledge and practice of handwashing of the participants may indicate the need for a complete public health education program on the subject. It was found that awareness of hand hygiene and compliance among school students was relatively low. The study shows that existing programs need improvement to change the behavior of hand hygiene to improve attitudes, knowledge, and practices (Sultana, Mahumud et al. 2016).

The study was conducted in Pakistan in 2015, the evaluation of the attitude of students towards oral hygiene determines that 98% of children believe that preserving the mouth is an individual responsibility. But 83% considered that it was not under their control; 58% had previously visited the dentist, of which 36% had specified the purpose of his visit as dental deterioration. However, 50% of the children did not have a positive attitude about the importance of the dentist's role in preserving their dental health. There was a statistically important relationship ($p < 0.001$) between

the positive attitude towards the role of the dentist and the frequency of visits to the dentist (Vakani, Basaria et al. 2015). Hazazi and his fellows conducted study the results of the study show that over 95% of the students knew the disease could be transmitted from person to person. Before and after eating and even after using the toilet, over 90% of students wash their hands with soap. Just 71.7 percent of students state they are twice-daily brushing their teeth. There was a positive relationship between the score of knowledge and practice and also the score of attitude with the score of practice. It was therefore concluded that the knowledge about personal among children in primary school students are adequate, but practice are still absent in some aspects (Hazazi, Chandramohan et al. 2018). Byrd-Bredbenner study results show that about 52% of students were classified with adequate knowledge of adequate hygiene. Most students about 99.0% washing their hands before meals, but the use of soap is only 36.2%. While 76.7% of students reported washing their hands after defecation, this practice was actually followed by only 14.8% of students (Byrd-Bredbenner, Maurer et al. 2017).

A study was conducted by Ghose and his fellows (2018) reveals that about 75% of children know about wearing shoes while using the latrine and after latrine use soap for handwashing. 80% were aware of washing hands with soap before eating. Most children have good knowledge of personal hygiene but their practices are inadequate. In the study it was found that more than 50% of children do not use soap for handwashing before eating and after use of latrine. Moreover, eating open food, defecating in open places and using latrines without shoes was quite common among them. The type of school, the socioeconomic status of families and geographical features have been reported as probable factors of knowledge and hygiene practices among children. A complete approach should be introduced that addresses the social, economic and geographical characteristics of children in order to improve hygiene practices among schoolchildren (Ghose, Rahman et al. 2018).

The study was conducted to evaluate the level of personal hygiene and its related factors. The finding of the study showed that only 22% of students achieved a score above 75% and were classified as good personal hygiene practitioners. Student age, parenting literacy, and family income were significantly associated with personal hygiene. The negative association between disease score and personal hygiene score show that children disease burden can be reduced with good hygiene practices. Therefore, it was decided that the systematic efforts to raise the awareness of personal hygiene, to improve the literacy of parents together with the economic empowerment of rural families can help to increase students' personal hygiene and, therefore, an extreme fall in the disease burden (Mangal, Kumar et al. 2019).

The study was conducted in a rural area to assess personal hygiene practices among government secondary school. "42.3% of students were followed Good hygiene practices. Relatively, female students had good hygiene practices than male students." Students who have knowledge about disease transmission had better hygienic practices, so it was concluded that less than half of the students have good hygiene practices and they needed a continuous education on health and reinforcement of the personal hygiene for these school-age children (Ratnaprabha, Kumar et al. 2018).

According to the study results show that with respect to personal hygiene practices, more than 70% of students respond "always" that they wash hand before and after eating, with just over a fifth indicating "sometimes". The immense majority of students dispose of solid waste in garbage cans (99.3%, n = 284), use garbage bags (80.8%, n = 231), open containers (64%, n = 183) and very few scatter anywhere in the compound school or in the classroom (respectively 9.1%, n = 26 and 8.7%, n = 25). The current low levels of hygiene knowledge among students in the study area have the



probable to affect student performance at school as risky hygiene practices make them susceptible to infectious diseases and the missing school (Thakadu, Ngwenya et al. 2018).

Methods:

Setting: This study was conducted in the community of Ali Raza Abad, Raiwind Road, Lahore.

Research design: A descriptive study design was used.

Population: The target population of the study was 125 school students of a rural community of Lahore.

Sampling: Convenient sampling technique was used in this study.

Research instrument: A well structured and adopted questioner from the study was used for collecting the data from the participant. After taking informed consent, data collected from students of high school according to the variable of the study.

Data gathering procedure: A formal written letter of permission to conduct the research. And the questionnaire was distributed to the high school children.

Analyze data: Data analysis is done on SPSS (version 21).

Outcomes of the study will offer as frequencies, mean, percentage, and the relevant statistical test.

Statistical significance will well-thought-out at p-value <0.05.

Study timeline: This study took 4 months (September 2019, to December 2019).

Ethical consideration: This research study met the national and international standards of research ethics as well as human subjects. The permission was taken from the research ethics committee of the Lahore school of nursing of the University of Lahore and also approved by the principal of primary school institution in the community. All the students of primary school showed full interest to join the interventional meeting after filling the consent form.

Results: This section presents the outcomes of the study.

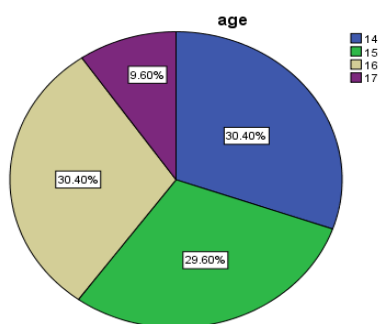
Profile of the respondents:

Section 1 Demographic

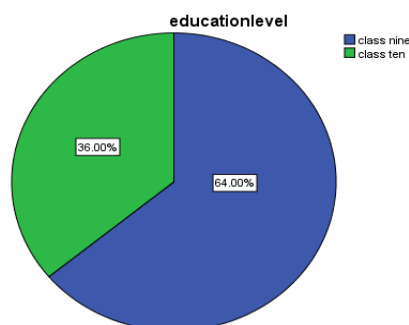
Respondents were taken from government high school students.

Table 1. Demographic Characteristics

	Category	Respondents	
		Number	Percent
Age (years)	14	38	30.4
	15	37	29.6
	16	38	30.4
	17	12	9.6
Class	9th	80	64.0
	10th	45	36.0
Gender	Male	125	100

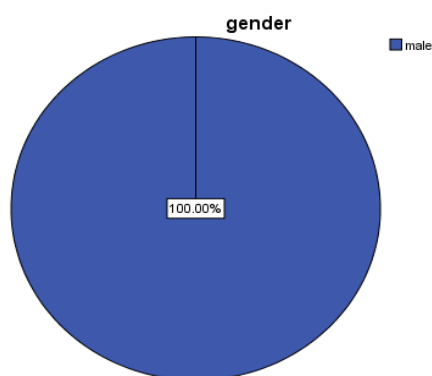


The above mentioned table shows that the participants of age 14 years are 38%, 15 are 37%, 16 years are 13% and 17 years are 12% respectively Figure No 2



The figure no 2 show that the percentage of educational level of participants, class nine and class tenth were 80% and 45% respectively.

Figure No 3



According to figure no 3, all the students participated in the study were male 100%. The frequency of male is higher in this study.

Section 2:

Section 2 represents the knowledge and practice about personal hygiene.

Knowledge on personal hygiene among secondary school grade nine and ten students



S.NO	Statements	Agree	Disagree	Don't know
1	Neatness helps in keeping us healthy	100%	0%	0%
2	Showering everyday keeps us clean	100%	0%	0%
3	Washing hand with soap is a healthy behavior	100%	0%	0%
4	Biting nail is an unhealthy behavior	100%	0%	0%
5	Maintaining proper hand hygiene prevents infection	100%	0%	0%
6	Brushing teeth regularly prevents teeth problems	100%	0%	0%
7	Regular dental checkup is important	100%	0%	0%
8	Sweets and soft drinks could affects teeth	100%	0%	0%
9	Microbes causes food poisoning	100%	0%	0%
10	Consuming raw meat affects health	63.2%	0%	38.8
11	Consuming raw vegetable affects health	56.8	0%	43.2
12	Flies could contaminate food	64.0	0%	36.0
13	Leftover food should be reheated before consuming	100%	0%	0%

Practices of personal hygiene among high school grade nine and ten students

S.N O	Statement	Always	Sometime	Never
1	I wash my hands before having meal	80%	20%	0%
2	I wash my hands after using toilet	100%	0%	0%
3	I wash my hands after playing	85.6%	14.4%	0%
4	I use soap for washing hands	58.4%	41.6%	0%
5	I brush my teeth after waking up	36.0%	64.0%	0%
6	I brush my teeth before going to bed	22.4%	77.6%	0%

7	I brush my teeth after having sweets	43.2%	56.8%	0%
8	I wash fruits vegetables before eating	100%	0%	0%
9	I wash my hand with soap after handling raw meat	43.2%	56.8%	0%
10	I taste food by finger while cooking	39.2%	47.2%	13.6%
11	I eat half cooked eggs	60.8%	39.2%	0%
12	I drink raw milk	56.0%	43.2%	8%

Discussion: This study was conducted to assess the personal hygiene knowledge and practices among government high school students of grade nine and tenth in rural community. A total of 125 among government high school were involved in this study. There was the participants of age 14 years are 38%, 15 are 37%, and 16 years are 13% and 17 years are 12% respectively. All the respondent were male.

Personal hygiene means personal care including Hair hygiene, Nasal hygiene, Eye hygiene, Oral hygiene, Hand hygiene, Body Skin hygiene, Personal cloths hygiene etc. The maintenance of personal cloths hygiene is affected by many reasons like personal, social, health, psychological and simply as a way of life (Kumar and Akoijam 2017). Proper knowledge and practices of personal hygiene plays critical role in avoiding communicable diseases and benefit the primary school children to enjoy healthy and productive school life (Ghanim, Dash et al. 2016). Lack of knowledge about personal hygiene and poor hygienic practices increases the burden of communicable diseases. Maintaining a good personal hygiene among children helps to improve the quality of life (Hazazi, Chandramohan et al. 2018).

The findings of the current study revealed that majority of students participated in the study answered correctly about the definition of personal hygiene and all question that related to personal hygiene, 100% respondent were strongly agree about the good personal hygiene keep health the participants has great knowledge about cleanliness which was supported by the study conducted by (Temitayo 2016) which revealed that 97.8 % of the respondents have answered correctly regarding the meaning of personal hygiene. Also it was supported by the study of (Kumar and Akoijam 2017) in which 100% of the respondents agreed that personal hygiene includes cleaning of the body and clothes.

Showering (bathing) was the most important aspect or component of personal hygiene that keep healthy. The finding of the study show that 100% respondent were strongly agree that showering keep us healthy This table show that all the participants has great knowledge about cleanliness In Pakistan bathing is an important hygienic practice that prevents body odor and irritation of the skin by removing sweat, sebum, and dead skin cells. The risk of lice as well as infections, fungi, scabies, and allergic diseases may emerge on an unwashed body due to dirty skin, clothes, and surroundings. The findings were similar to the study conducted by (Ghanim, Dash et al. 2016) who's found that showering was the most important aspect of personal hygiene and all the participant were agree that showering keep healthy.

The current study result show that that all the participant (n-125) 100% were agree and have good knowledge about regularly brushing teeth prevent teeth problem and (n-125) 100% were agree about by maintaining the proper hand washing practices prevent the students from different types of infection. Study outcome were parallel to the study conducted by (Temitayo 2016) in which result showed that majority of the respondents (98.2%) had good knowledge of personal hygiene and



result also showed that majority of the respondents had good hygienic practices including taking bath (99.6%), brushing teeth (98.2%) and washing hands (99%). High school students have good personal hygiene knowledge and good personal hygiene practices.

The finding of the study shows that participant 100% agree about unhealthy behavior toward nail biting and respondents reported they cut their nails weekly. This result was supported by another (Rajbhandari, Dhaubanjari et al. 2018) although slightly lower where 74.2% of the students were found trimming their nail once a week. Also in this study 65.9% of the respondents reported washing their hands daily. The practice of the respondents about washing of hands is 89.1%.

The percentage of the respondents who practiced seeing their doctors and their dentists regularly in the absence of illness were 47.4% and 46.4% respectively. The findings of this study was supported by a study by (Hazazi, Chandramohan et al. 2018) who reported that only few of the adolescents go for dental checkup at least once a year.

The result of current study shows that shows that out of total 125 participants 58.4% (n=73) participants respond always that they use soap for washing hands. While 41.6% (n=52) participants respond sometime using soap for hand washing. The practices of washing hands with soap is not proper among the participants. Study outcome were parallel to the study conducted by (Srivastava and Mehta 2018) a study shows that 57.4% student wash their hand after toileting with Soap and water, while 63.2% did hand washing practice after cleaning with soap and water and 31.6% of student washed their hands before eating food with Soap and water. Proper Hand hygiene practices increased with the increase in education.

Limitations: The study was certain limitations that need to be acknowledged in the interpretation of the result.

This was a cross-sectional study, therefore interpretations correlated to causality of relationship could not be drawn, and however, case control and cohort studies should be conducted to establish causal relationship.

As the information was gathered from just a single setting, it has restricted generalizability.

Convenient sampling was applied in data collection process whereas the probability sampling method can enhance the induction of different strata of the participants.

The study was limited to assess knowledge and practice regarding personal hygiene among school students in rural community of Lahore.

Conclusion: The outcome of this study reveals that majority of the government high school students considered in this study have good level of personal hygiene knowledge and a good number of them have high level of personal hygiene practices. From the present study conducted among high school students in Lahore it can be concluded that the percentage of hygiene practices and knowledge among high school students was satisfactory.

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STUDY OF Y-CHROMOSOME POLYMORPHISM IN THE POPULATION SAMPLE OF THE NORTH-EAST REGION OF AZERBAIJAN

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Background: High conservative Y-chromosome STR (short tandem repeats) markers constitute a separate family of STR-markers and have great importance in resolving issues of forensic medical examination, for studying the structure and genealogy of human populations from different parts of our planet, for ethno-genetic haplotyping of various ethnic groups etc. The Azerbaijani population has not been studied comprehensively and systematically with these markers. However Azerbaijan population was mentioned in several works devoted to the study of these markers among populations of the Caucasus, Turkey and Iran (Nasidze et al., 2003a, 2003b; Rootsi et al., 2012). There is an information relative to the study of minority populations of Azerbaijan and Iran (Roewer et al., 2009), Turkic-speakers of the Iran (Andonian L. et al., 2011) and Caucasus (Skhaljaho et al., 2013), including Azerbaijanis with Y-STR markers. As can be seen, the study of the Azerbaijani population was mainly carried out by foreign researchers. In this regard, the results of the work (Aliyev et al., 2018) carried out within the Azerbaijan family tree DNA project (<https://www.familytreedna.com/public/Azerbaijan/default.aspx?section=yresults>) are encouraging.

Aim:As a continuance of the previous works (Mustafayev et al., 2020a, 2020b), the aim of this research was to study the Y-DNA polymorphism in the population sample from the north-east region of Azerbaijan Republic.

Materials and methods: The object of the study was DNA samples isolated from 57 native male Azerbaijanis living in the north-east region of the Azerbaijan Republic for the several generations. All blood samples were collected following international ethics rules: signed written consent as well as filling out the short questionnaire from all donors and securing of anonymity were provided. DNA profiles obtained by PCR using multiplex AmpFLSTR™ Yfiler™ PCR Amplification Kit consisting of 17 Y-STR loci. The revealed haplotypes validated by Y-STR haplotype validating test presented by Y-STR Haplotype Reference Database (YHRD) (Willuweit and Roewer, 2015, <https://www.yhrd.org>). Allele frequencies and some parameters of STR loci calculated by Power Stat software, haplogroups were identified by the help of haplogroup predictors: NEVGEN (<http://www.nevgen.org/>, as main predictor), and Whit Athey's haplogroup predictor (<http://www.hprg.com/hapest5/hapest5a/hapest5.htm?order=num>, as an alternative predictor).

Results: Analysis showed that the allele frequencies vary within 0.0175-0.7368. An allele 11 of the DYS392 locus had highest frequency (0.7368). The multiplex DYS385a/b marker identifies 33 genotypes in the studied population. Among them the allele pairs 11,14; 12,19; 13,13; 13,18; 14,15



and 15,17 of the DYS385a/b loci are found more often. The total frequency of these alleles is 0.3859 (~40% of the total). The lowest value for the haplotype diversity (H_D) was observed for DYS391 (0.4199) and the highest one for DYS385 (0.9614) marker. The values for some forensic and population-genetic parameters vary: matching probability (MP) 0.0428 (DYS385a/b) – 0.5820 (DYS391), power of discrimination (or discrimination capacity) (PD) 0.4180 (DYS391) – 0.9572 (DYS385a/b); polymorphic information content (PIC) 0.3754 (DYS391) – 0.9642 (DYS385 a/b). The values of combined parameters are also calculated: $CH_D=0,999999993$; $CMP=0,999491235$; $CPD=0,999999990$; $CPIC=0,999999932$. High values of overall haplotypes diversity (0.999999993), and power of discrimination (0.999999990) for the 17 Y-STR loci indicated that these Y-STR markers are suitable for solution of forensic issues. Haplotype data of Azerbaijan population was compared with relevant available data of other world populations refer to various races and population clusters by means of AMOVA tool provided by YHRD website (www.yhrd.org). Interestingly, the populations of Tabriz (Iran, Azerbaijani) and China (Uyghur) turned out to be the closest to our population ($R_{ST}=0.0258$ and $R_{ST}=0.0281$, respectively). The populations of Turku (Finland, Finnish), Bolivia (Boliviano), Australia (Asian) and China (Han) populations turned out to be more distant populations ($R_{ST}=0.2769$, $R_{ST}=0.1655$, $R_{ST}=0.1261$ and $R_{ST}=0.1028$, respectively). Based on pairwise F_{ST} genetic distances values of Azerbaijan population and other world populations available in YHRD database multidimensional scaling (MDS) plot was built.

At the definition of haplogroups by different predictors revealed following haplogroup branches (frequencies in %): E (E1b1b – 14.04), G (G2 – 12.28), J (J1 – 29.82; J2 – 12.28), I (I1 – 1.75; I2 – 1.75), H (1.75), L (1.75), N (1.75), R (R1a – 7.02; R1b – 14.04) and T (1.75). Haplogroups G1, Q and R2 were not identified. The possible times of origin of the main branches of Y-DNA tree vary within ~12,500÷52,500 years ago.

Conclusions: It is established that in formation of Y-DNA gene pool of the studied Azerbaijan population play an important role the haplogroups North African, Caucasian, Mediterranean and Eurasian origin E (E1b1b), G2, J (J1 and J2) and R (R1 and R2) and make up about 75.44% of all observations.

Keywords: Y-DNA polymorphism, Azerbaijan population, haplotype, haplogroup, allele, frequency.

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DIABETES MELLITUS AS A MAJOR RISK FACTOR FOR SOME TYPES OF CANCER

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ABSTRACT

Diabetes and cancer worldwide are diseases that have a significant impact on health and are one of the causes of rapidly increasing mortality. While the most frequently diagnosed cancers belong to the lung, breast and stomach, diabetes is the most common type 2 diabetes type. There are common risk factors for diabetes and cancer such as smoking, sedentary lifestyle and many other. Moreover, some diabetes therapies like emaciation may protect the progression of cancer. Our aim in this study is to examine the relationship between diabetes and cancer diseases, related genes, and the effects of diabetes on emergence and development of different cancer types. The incidence and mortality rate of diverse types of cancer such as pancreatic (Huxley et al., 2005), liver (El-Serag et al., 2006), breast (Larsson et al., 2007) and bladder cancers (Larsson et al. 2006) have an increase in diabetic patients, in contrast, this indicator decreases in patients with prostate cancer (Kasper & Giovannucci, 2006). Different levels of metabolic control, various medications used for treatment, and complex factors make it difficult to assess cancer risk in diabetic patients. Regardless, antidiabetic drugs have low effect on cancer, drugs used to treat cancer can cause diabetes or worsen pre-existing diabetes (Vigneri et al., 2009). Although the biological mechanisms are not fully understood, factors such as insulin / insulin-like growth factor (IGF), hyperinsulinemia, and hyperglycemia contribute to the metabolic progression of cancer. As it's known there are three factors that affect all types of cancer. These factors are: Insulin/IGF activates metabolic and mitogenic signaling pathways, hyperglycemia provides energy for cancer cell growth, and inflammatory cytokines affect cancer cell apoptosis (Wang et al., 2020).

In addition, there are genes associated with both diabetes and cancer, but these genes are different for each type of cancer and diabetes. Common genes for diabetes and pancreatic cancer: AOX1, RAB5A, HERC3, GALR3, GCAT, TJP2, WEE1, OR1J1, RPL31, MC3R, RAC3, SIN3A, RB1, FOS, CDH1, NFKBIA, GNAT1, PAK3, RHOA, RASGRP1, PIK3CD, BMP6, CHEK2, E2F2, EPAS1, DAPK3, MAP2K (Tang et al., 2014); genes associated with diabetes and liver cancer and: CDNF, CRELD2, DNAJB11, DTL, GINS2, MANF, PDIA4, PDIA6 and VCP (Liu et al., 2019); for diabetes and breast cancer SLC30A8, HHEX-EXOC6, IRS2, CDKAL1, CDKN2A-CDKN2B, SAT2, SHBG, MTNR1B, TCF7L2, KT1, FGF2, FLT4, IGF1, IGF1R, IGF2BP2, PIK3CA; for diabetes and bladder cancer: EGF, EGFR, ERBB2, MMP2, MMP9, SRC, THBS1, VEGFA (Wen et al., 2019).

It has been observed that genes associated with diabetes in pancreatic cancer play an important role in the interaction of MAPK (mitogen-activated protein kinase) signaling pathway and activation of JNK (c-Jun N-terminal Kinase) pathway. The Wnt signaling pathway, which is a key signal pathway in stem cell development, cell proliferation and apoptosis regulation, is also closely associated with the emergence and development of cancer. In general, genes highlight pathways involved in cancer development, associated with insulin resistance and apoptosis. There are also

common mutation variants for diabetes and cancer, for which we can cite GNAS mutations as an example. GNAS mutations encode the G protein α unit, which binds receptors to intracellular cyclic AMP (cAMP) formation (Forbes et al., 2011). GNAS mutations are frequently found in the intraductal papillary mucinosis neoplasm of the pancreas (Furukawa et al., 2011).

Keywords: Diabetes; Cancer; Insulin/Insulin-like growth factor axis; Hyperglycemia; associated genes.

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NEUROIMAGING IN PEDIATRIC HEADACHES: OUTPATIENT EXPERIENCE IN TERTIARY CENTER

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ABSTRACT

Introduction: Headaches are common in children, with the most common cause being tiredness, short-sightedness, viral fever, sinusitis, genetic predisposition and psychosocial stressors, rarely also the presenting symptom of a trauma, an intracranial mass, a metabolic or vascular disease. Most headaches are benign primary headaches, and include migraine, tension-type headache and, less often, cluster headache. A detailed patient history and clinical neurological examination should seek to differentiate between primary and secondary headache and identify any “red flags”. Imaging studies are reported to be completely normal in most of the children with headaches. Meanwhile, is crucial for children with headache to be referred for neuroimaging if any of the known “red flags” is noted.

Aim: To evaluate the importance and usefulness of neuroimaging in pediatric patients with headache seen in neurologic outpatient in tertiary hospital.

Methods: The data were retrospectively collected from patient records (n = 98) and neuroimaging reports. Headache was classified according to International Headache Society (HIS) guidelines.

Results: There were 80 children with imaging studies (MRI n = 75, CT n = 10, five of which had both CT and MRI), of which 6 demonstrated an abnormal finding. Findings altering the management were obtained in 6 (8%) patients: one (n =1, 1.3%) had headache for less than 1 month, while 5 patients had headache longer than 1 year (n=5, 6.66%), with normal neurological examination and significant MRI results affecting management. None of the children in whom the diagnosis of migraine could be made on clinical grounds (n = 11) had a significant MRI finding.

Conclusion: Brain MRI is the neuroimaging modality of choice and it should be performed selectively in children with headache seen in pediatric neurology clinics, especially in headache of long duration (> 1 year), abnormal neurological examination and features atypical for migraine.

Key words: pediatric, headache, migraine, neuroimaging

Introduction: Headache is defined as pain in the face, head, or neck, with prevalence ranges from 37-51% in elementary-school children and gradually rises to 57-82% in the high-school students and reported to be more common in children with a positive family history of headaches. The classification scheme for headaches including the diagnostic criteria is provided from the International Headache Society (IHS) in three main classifications: a) Primary headaches including migraine, tension-type, and cluster; b) Secondary headaches related to head/neck trauma, vascular and nonvascular disorders, infection, or psychiatric disorders and c) Cranial neuralgias, central and primary facial pain, and other headaches. Currently accepted diagnosis of pediatric headache is based on the ICHD-II classification system. Appropriate assessment of children with headache should include characterization of the pain experienced by the child, identification of the triggers and identification of any relevant family history, a detailed patient history and clinical neurological examination that will help in narrowing down the etiology and identifying any “red flags”, signs that may indicate headache secondary to a more serious condition, such as brain tumor, subdural hematoma, a cerebral or vascular malformation or infection. An eye exam including fundoscopy can detect papilledema, a sign of increased intracranial pressure. Imaging studies are reported to be normal in most children with headache, however, neuroimaging such as brain computerized tomography (CT) scanning or brain magnetic resonance (MRI) is indicated if “red flags” are noted, including: new and dramatic onset of headache, a marked increase in headache severity or frequency over time, headache exclusively in one location, headaches that wake the child up in the middle of the night, or occur first thing in the morning, headache provoked by coughing, straining or sneezing, or headache provoked or aggravated by the Valsalva maneuver, headache that is worse when the child is in a horizontal position that may be a sign of increased intracranial pressure, papilledema, unilateral weakness or numbness, diplopia, abnormal eye movements or focal motor or sensory changes on neurological exam, imbalance, confusion, incoherent speech, and seizure. Imaging pathological findings were reported in children with abnormal signs on neurological examination. Although most headaches are relatively benign, perhaps 1% to 3% of these patients have life-threatening pathology, including subdural and epidural hematomas, that are detected on CT and MRI scans. Electroencephalography (EEG) is reported as not useful in the routine evaluation of patients with headache. White matter abnormality (WMA) have been reported on MRI studies of patients with all types of migraine, with a range from 12% to 46%.

Methods: In this study the data were retrospectively collected from patient records (n = 98) and neuroimaging reports (n =80) in our hospital system. Included were children presented with headache, in neurologic outpatient in University Clinic of children disease for a period of 15 months, from January 2020 year until March 2021 year. Headache was classified according to International Headache Society (IHS) guidelines.

Results: There were 98 children with headache examined in our neurologic outpatient, who previously had no neurological disease, 54 of which were boys and 44 girls of age 2-14 years old. All the children included had a normal neurological examination. According to the HIS guidelines there were 11 children with primary headaches, meanwhile migraine, and the rest were classified as secondary headaches related to head trauma one patient, two patients with WMA, three with nonvascular disorders, 23 with upper respiratory tract infection such as sinusitis, rhinitis and tonsillitis, and 6 with vision disorders (myopia, hypermetropia), and the rest were related to psychosocial stressors at home and in school. The patient with secondary headache related to head



trauma started having headache a few months after traumatic subarachnoid hemorrhage. Out of these children in 80 were performed imaging studies, meaning brain MRI scans was performed in 75 and, brain CT scans in 10 of them, while 5 children had both brain CT and MRI. Of patients who had at least one MRI study, six demonstrated an abnormal finding that is 8% (see Table 1).

Table 1: Performed investigations

	Brain MRI	Brain CT	EEG	Fundoscopy
All patients (n, %),	75 (93.75%)	10 (10.2%)	45 (45.9%)	55 (56.12%)
Abnormal findings (n, %)	6 (8%)	0 (0%)	25 (55.55%)	0 (0%)

From these abnormal findings two revealed an arachnoid cyst, one showed a subarachnoid hemorrhage due to a post traumatic contusion, another one revealed an empty Sella and two showed WMA of which one was due to a suspected neurofibromatosis and the other one due to a demyelinating disease (see Table 2). Out of 63 children with performed imaging studies, in 57 children the brain MRI revealed normal findings and all who had a brain CT (n=10) it showed normal findings.

Table 2: Abnormal brain MRI findings

Patient	1	2	3	4	5	6
Brain MRI	Arachnoid cyst in left temporal region	Arachnoid cyst	Subarachnoid hemorrhage in frontal and left temporal region	T2W and flair hyper intense lesion in left cerebral region near vermis	T2W and flair hyper intense lesions near internal capsule and basal ganglia, and in mesencephalon	Empty sella

Insignificant findings were found in brain MRI scans in 11 children which showed mucous thickening of the paranasal sinuses mostly in the maxillary sinuses due to chronic inflammation of the corresponding sinus cavity, presence of a cyst or polyp in the sphenoid or maxillary sinus, and all of them had a corresponding upper respiratory tract infection, acute or chronic sinusitis, rhinitis or tonsillitis (see Table 3).

Table 3: Other findings

MRI of paranasal sinuses	Patient (n, %)	ORL findings/ Due to
Polycystic and polypoidal findings in maxillary, ethmoidal and frontal sinuses	1	Chronic sinusitis
Mucosal thickening of maxillary sinus	1	Allergic rhinitis
Cyst in sphenoidal sinus	1	None
Cyst in maxillary sinus	1	Chronic tonsillitis
Mucosal nasal thickening	4	Allergic rhinitis
Mucosal thickening of maxillary sinus + Mucosal nasal thickening	3	Allergic rhinitis
Mucosal polypoid thickening of maxillary sinus + Mucosal nasal thickening	1	None
Not done/none	4	Chronic sinusitis
Not done/none	5	Allergic rhinitis
Not done/none	3	Chronic tonsillitis

EEG was performed in 45 children, of which 25 revealed normal findings while the rest showed either the presence of a focal spike waves or slow high voltage waves. (See Table 4). Fundoscopy was performed in 55 children, all of which showed normal findings. From the children who had fundoscopy, four of them had myopia, one was hypermetropic and one had myopic astigmatism.

Table 4: Normal and abnormal EEG findings

EEG findings	Patient (n= 45, %)
Normal findings	25 (55.55%)
Focal spike waves in left hemisphere	6 (13.3%)
Focal spike waves in right hemisphere	10 (22.22%)



Focal slow high voltage waves	2 (4.44%)
Focal spike waves in both hemisphere	3 (6.66%)

Findings altering the management were obtained in 6 (8%) patients: one (n =1, 1.3%) had headache for less than 1 month. On the other hand 5 patients with headache longer than 1 year (n=5, 6.66%) and with normal neurological examination had significant MRI results affecting management. There were 11 children in whom the diagnosis of migraine could be made on clinical grounds and none of them (n = 11, 11.22%) had a significant MRI finding, while all of them had pathological elements on EEG.

Conclusion: Headaches are common in children. Knowledge of red flag symptoms for headaches will help one to exclude sinister causes of headaches in children. Brain MRI is the neuroimaging modality of choice, though there is a high rate of incidental findings and often does not change headache management. Meanwhile, children should be referred for brain CT scan if bleeding or fracture is suspected. In young children, the cost and the need for sedation should be taken into account when making decision of performing a neuroimaging. Therefore, neuroimaging is suggested in children with a suspicious clinical history, abnormal neurological findings especially in headache of long duration (> 1 year) and features atypical for migraine. Pathological brain MRI findings can be found and in patients with normal neurological examination, therefore a normal neurological examination should not reassure the clinician. Further studies are needed to enrich our knowledge about the pathophysiological mechanisms that cause headaches in children and adolescents and to develop efficient strategies to alleviate their burden. EEG is not indicated unless seizures occurred or are suspected.

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CASES OF SEVERE THROMBOSIS AND RETHROMBOSIS IN COVID-19 PATIENTS

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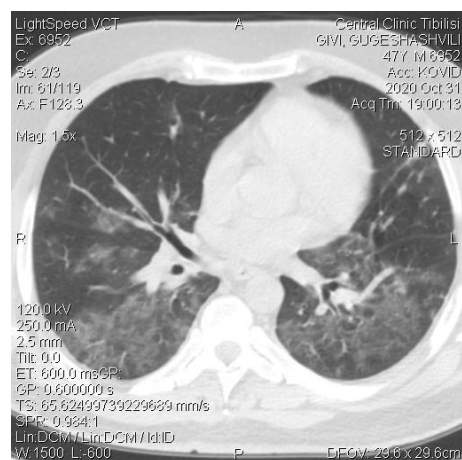
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Introduction: SARS-CoV-2 infection is associated with arterial and venous thrombotic complications. Autopsy findings revealed microthrombi in multiple organ systems, that may contribute to multisystem organ dysfunction in severe COVID-19. Thrombosis in patients with COVID-19 may be due to a cytokine storm, hypoxic injury, endothelial dysfunction and increased platelet activity. Many difficult mechanisms contribute to formation of clots in vasculature of multi organs,

We presented two different cases of pulmonary artery thrombosis complicated by severe ARDS and rethrombosis in the branches of the pulmonary artery. Both patients were treated according to PE (pulmonary embolism) management protocol (ESC)

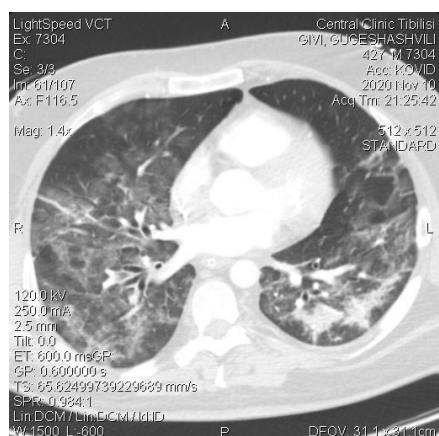
Conclusion: The multisystem mechanisms: The complement system, part of the innate immune response, capable of activating the coagulation cascade, endothelial inflammation, loss of ACE2 and alteration of PAI/tPA balance, cytokine storm, high levels of the blood clotting protein factor, decreased concentrations of endogenous anticoagulant proteins increase the probability of new thrombosis, despite suitable treatment and prevention.

Patient N 1



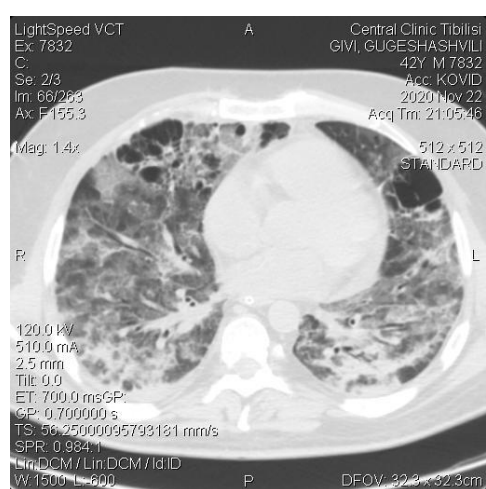
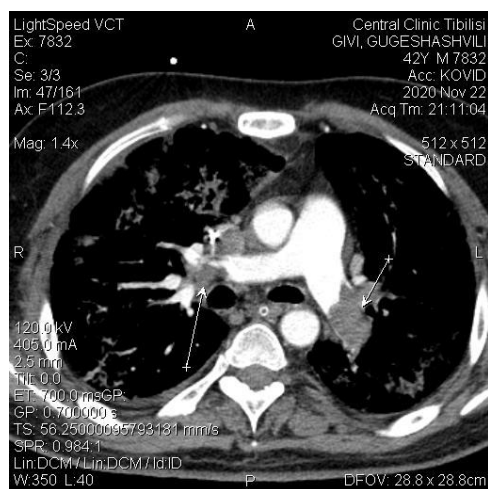
Picture 1. Computed tomography of the chest, axial section, pulmonary window.

On all sides, all fields are covered with foci of ground glass type infiltration and interstitial consolidation. Free fluid and air are not reflected in the bilateral pleural space. On semi-quantitative analysis of computed tomography data, the lung injury index was 18 points (0-24). [pict.1]



Picture 2. Computed tomography of the chest, axial section of the pulmonary window.

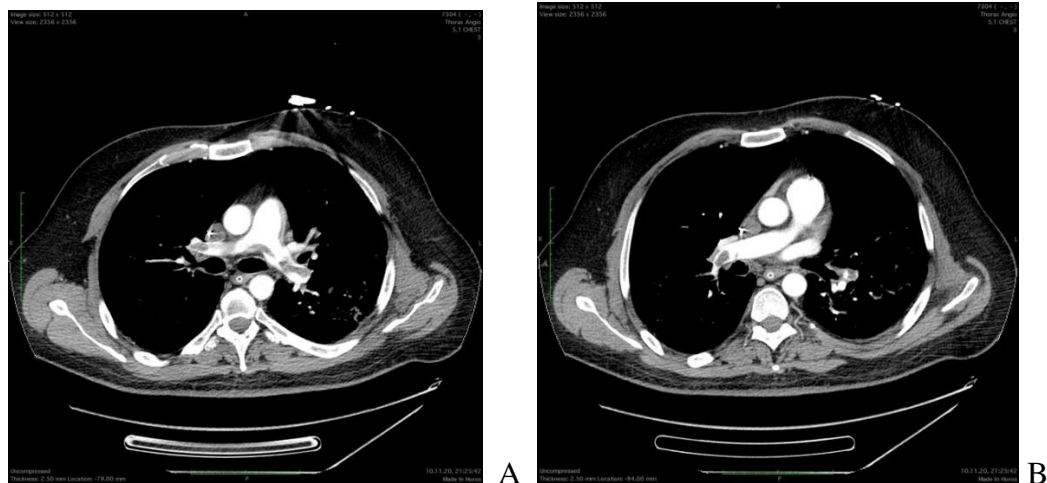
The volume and intensity of infiltrative changes increased in all bilateral lung fields. Areas of consolidation have been identified. In a semi-quantitative analysis of computed tomography data, the lung injury index was 21 points (0-24). [pict2]



Picture 3. Computed tomography of the chest, axial section of the mediastinal window

A. On both sides, thrombotic formations are observed in the right and left main arteries of the lung, in the lumen of the parietal and segmental branches.

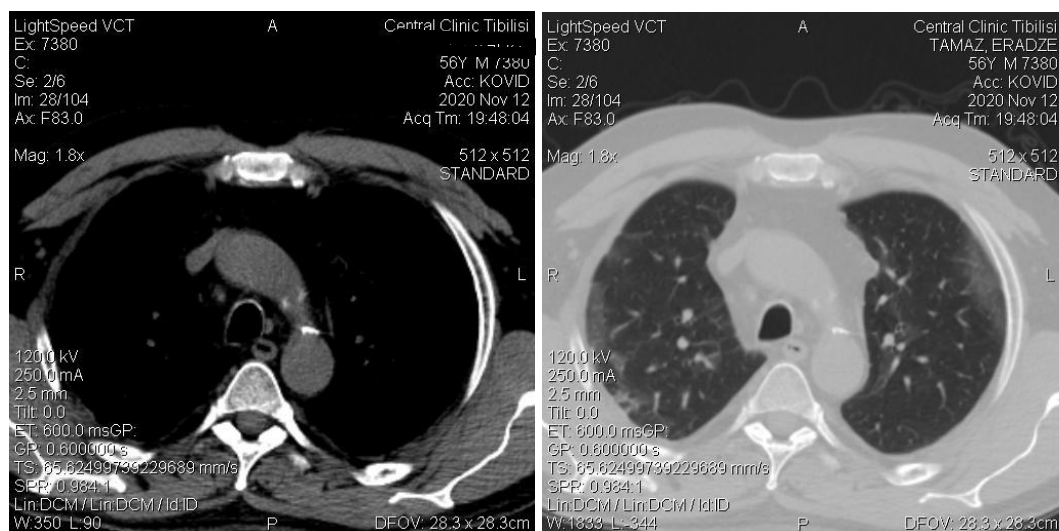
B. The volume and intensity of the infiltration increase. In the ventral segments, areas of lung tissue rupture were revealed. Semi-quantitative methodological analysis of computed tomography data, lung lesion index - 24 points (0-24). [pict.3]



Picture 4

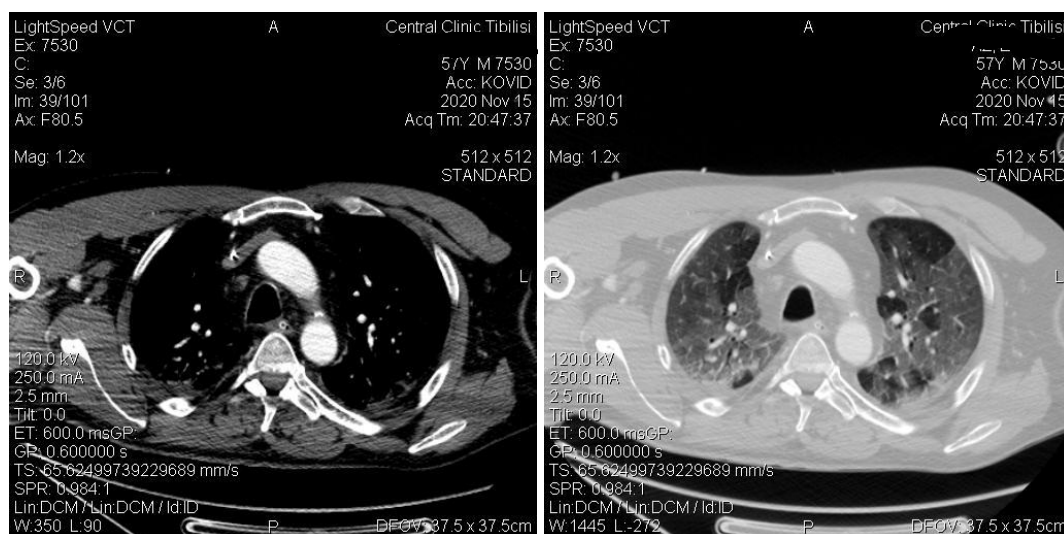
B. Angiographic examination does not reveal reliable signs of thrombosis of the lung trunk. Spreading from the level of the lung trunk bifurcation, thrombotic masses are reflected in the lumen of both large bronchi. Saddle thrombus. Thrombotic formations are reflected in the bilateral lobal and segmental arteries.

Patient N 2



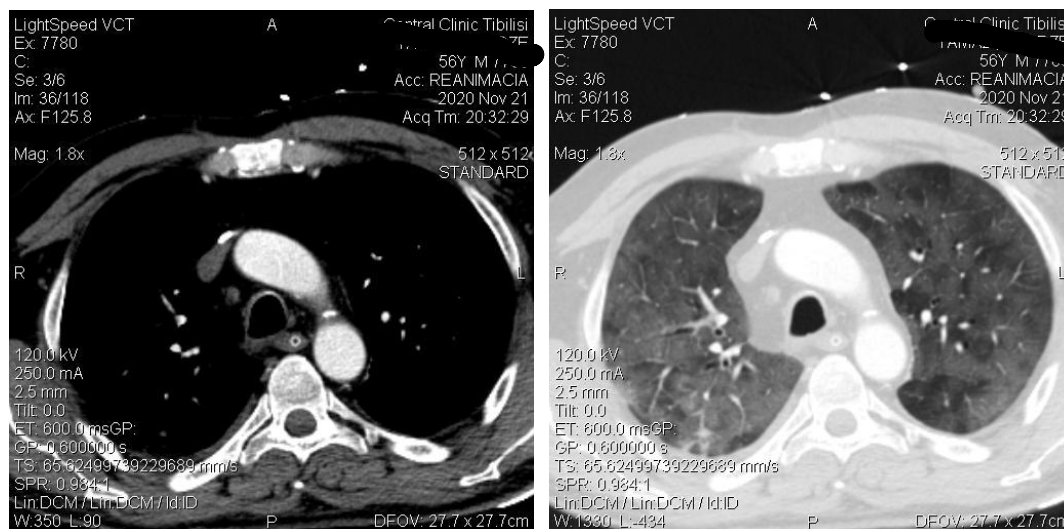
Picture 1

On both sides, there is an infiltrative change in the lungs in the form of a ground glass phenomenon without fluid in the pleural cavity. Semi-quantitative methodological analysis of computed tomography data, lung lesion index - 17 points (0-24).[pict1]

**Picture 2**

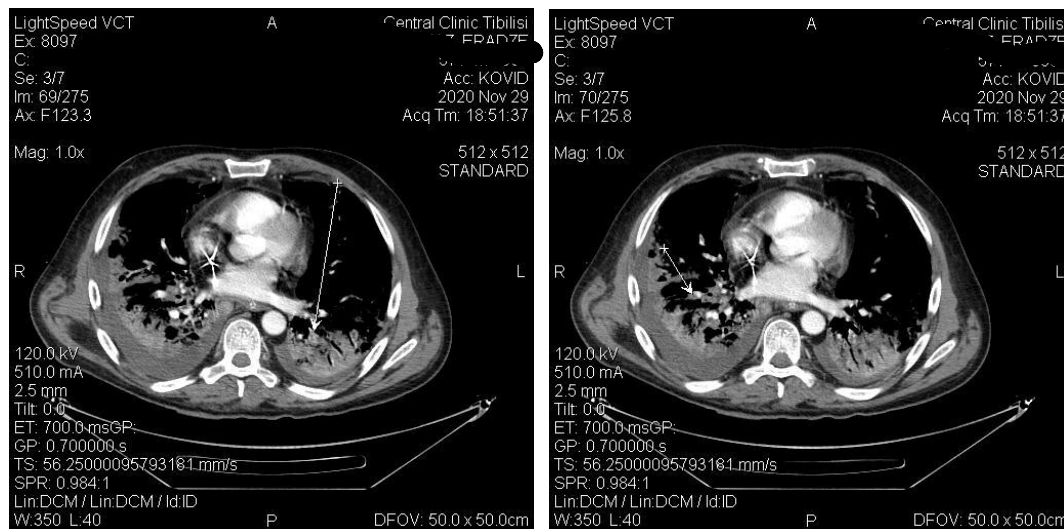
Angiographic examination does not reveal pulmonary thrombosis. The lumen of small arteries in the lower left corner is not completely contrasted, which suggests the presence of thrombotic masses. On both sides of the lung, there is a typical phenomenon of total ground glass, consolidation dorsally in the lower fields. Free fluid and air on both sides of the pleura are not detected

In a semi-quantitative analysis of computed tomography data, the lung injury index was 23 points (0-24).[pict.2]

**Picture 3**

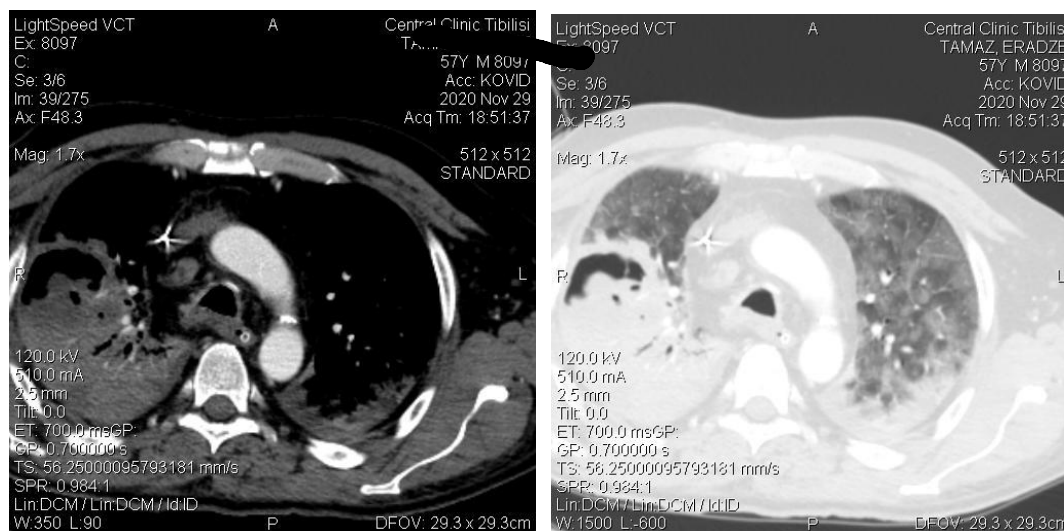
There is still lesion on both sides of the lungs, an almost entirely common ground glass phenomenon, although there is a relative decrease in intensity.

In the bilateral pleural cavity, a small liquid discharge, free air is not reflected. In a semi-quantitative analysis of computed tomography data, the lung injury index was 23 points (0-24). [pict.3]



Picture 4

Angiographic examination showed no filling defect in the lung trunk and bilateral main artery. Thrombosis in the right lower artery is increased, in the left basal thrombus masses are reduced and reflected in the lumen of the segmental arteries. Shown by arrows.[pict.4]



Picture 5

The intensity of the lesion was increased according to the type of ground glass phenomenon, which is totally widespread in both lungs; in the lower fields, extensive areas of consolidation appeared, against the background of which zones of avascular infarction pneumonia are revealed. Foci of destruction - 5.2 cm laterally in the right middle field.



The fluid is detected in the bilateral pleural cavity, the separation on the right is 2.2 cm, on the left is 1.0 cm, free air is not reflected.

In a semi-quantitative analysis of computed tomography data, the lung injury index was 24 points (0-24). [pict.5]

Discussion: The pathophysiology of thromboembolism in COVID-19 related to endothelial inflammation, hypercoagulability associated with increased concentrations of coagulation factors, acquired antiphospholipid antibodies, and decreased concentrations of endogenous anticoagulant proteins, loss of ACE2 alters PAI/tPA balance. High levels of the blood clotting protein factor V is at elevated risk from blood clots such as deep vein thrombosis to pulmonary embolism. Immune complex vasculitis is pathological mechanism of covid-19 pulmonary artery thromboembolism, venous sinus thrombosis, cytokine storm.

SARS-CoV-2 invasion of ACE-2 receptor expressing cells (airway epithelial cells, vascular endothelial cells, circulating monocytes), causes cellular damage, release of pro-inflammatory chemokines and chemoattractants (including C3a and C5a). The complement system is part of the innate immune response [1.2.], the complement system is an important host mediator of SARS-CoV-induced disease and that complement activation regulates a systemic proinflammatory response to SARS-CoV infection, complement system is over activated and contributes to the dysregulated host immune response [3.4.5.]. the complement system activates the coagulation cascade, increases tissue factor activity [6.7.8.9.], increases platelet activity and aggregation [10.11.12.13.], as well as stimulate endothelial cells to release von Willebrand factor and express P-selectin [14.15.16]. Complement also regulates fibrinolysis, with complement cascade inhibitors [17], and activates the fibrinolysis inhibitors PAI-1(plasminogen activator inhibitor-1) and TAFI [Thrombin Activatable Fibrinolysis Inhibitor].

Such difficult and multisystem mechanisms contributes formation clots in vasculature of multi organs, Increases probability of new thrombosis, despite suitable treatment and prevention.

Conclusion: The multisystem mechanisms : The complement system, part of the innate immune response and capable of activating the coagulation cascade, endothelial inflammation, loss of ACE2 and alteration of PAI/tPA balance, cytokine storm, high levels of the blood clotting protein factor, decreased concentrations of endogenous anticoagulant proteins increases probability of new thrombosis, despite suitable treatment and prevention.

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INFLUENCE OF VARIOUS SHAPED METAL-CERAMIC FIXED PROSTHESIS ON THE MUCOSA OF MAXILLARY AND MANDIBULAR GINGIVA

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In everyday practice, dentists regularly come across patients who have lost one or more teeth and therefore suffer numerous aesthetic and functional unwanted effects that affect their overall health and masticatory function. A possible treatment for these patients is fixed partial dentures (FPD), which are intended to restore lost teeth structure. The fixed dental prosthesis is one of the most commonly used prosthesis in dental clinical practice for restoring function and health of oral tissues. This type of dental prosthesis is not without complications

The aim of the present study was to identify cytological changes in maxillary and mandibular gingival mucosa resulting from variously shaped intermediate parts of metalloceramic bridge prosthesis.

Materials and methods: Evaluation of cytological changes of gingival mucosa included two subsequent steps: prior to prosthesis placement and 3-6 months after placement of prosthesis with saddle shaped, contact and oval intermediate parts. In I stage of examination patients were divided into 2 groups: I.I group - patients with the high indexes of destruction and inflammation-destruction and I.II group - patients with the low indexes of destruction and inflammation-destruction. 3-6 months after placement of prosthesis was performed II stage of examination of I.I and I.II group's patients' maxillary and mandibular mucosa. The gingival mucosa was examined by Papanicolaou staining. The status of oral mucosa was evaluated using cytomorphometric indexes: index of cells differentiation (ICD), index of keratinization (KI), index of destruction (DI) and index of inflammation-destruction (IDI). The statistical significance of differences was measured by T-test.

Conclusions: Cytological examination of the gingival mucosa revealed changes not only after placement of fixed metalloceramic prosthesis but also differences in cytological data between maxillary and mandibular mucosa. Based on the results of cytological examination we can formulate the following recommendations:

1. Prior to use metalloceramic prosthesis with variously shaped intermediate parts, cytological examination of gingival mucosa is recommended including estimation of indexes of destruction and inflammation-destruction. This is important for evaluation of final results of orthopedic treatment.
2. Based on cytological changes of gingival mucosa metalloceramic prosthesis with saddle shaped intermediate part should not be used for mandible.
3. According to cytological examination of adjacent gingival mucosa, metalloceramic prosthesis with oval intermediate part is the best for mandible.



4. According to cytological examination of adjacent gingival mucosa, metalloceramic prosthesis with contact intermediate part is the best for maxilla.

Keywords: Fixed Metal-Ceramic prosthesis; maxillary and mandibular gingival mucosa; Cytomorphometric Indexes;

In everyday practice, dentists regularly come across patients who have lost one or more teeth and therefore suffer numerous aesthetic and functional unwanted effects that affect their overall health and masticatory function. [1] Loss of function reduces one's ability to eat a balanced diet, with negative consequences for systemic health. Loss of esthetics can also negatively impact social function. [2] The fixed dental prosthesis is one of the most commonly used prosthesis in dental clinical practice for restoring function and health of oral tissues. [3] Although fixed metallic appliances greatly impact patients' lives [4] Unfortunately, these restorations are not without cost as these often extend into the gingival sulcus and come in contact with gingival epithelial [5], they also alter and modify oral microbial flora.[6]

The aim of the present study was to identify cytological changes in maxillary and mandibular gingival mucosa resulting from variously shaped intermediate parts of metalloceramic bridge prosthesis.

Materials and methods: Evaluation of cytological changes of gingival mucosa included two subsequent steps: prior to prosthesis placement and 3-6 months after placement of prosthesis with saddle shaped, contact and oval intermediate parts.

In I stage of examination patients were divided into 2 groups:

I.I group - patients with the high indexes of destruction and inflammation-destruction

I.II group - patients with the low indexes of destruction and inflammation-destruction

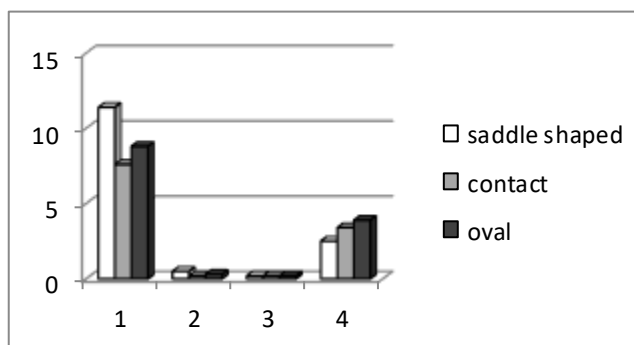
3-6 months after placement of prosthesis was performed II stage of examination of I.I and I.II groups patients' maxillary and mandibular mucosa.

The gingival mucosa was examined by Papanicolaou staining. The status of oral mucosa was evaluated using cytomorphometric indexes: index of cells differentiation (ICD), index of keratinization (KI), index of destruction (DI) and index of inflammation-destruction (IDI). The statistical significance of differences was measured by T-test. The data were considered reliable when $p < 0.05$.

Result: The cytological results of maxillary mucosa.

The comparative study of cytological data in the patients of subgroup I.I (patients with the high indexes of destruction and inflammation-destruction) 3-6 months after placement of metalloceramic prosthesis with saddle shaped, contact and oval intermediate parts has showed that:

CDI (the index of cell differentiation) is 1.5 times more after placement of saddle prosthesis ($p < 0.05$), than after placement of contact prosthesis, and 1.3 times more ($p < 0.05$), than



after placement of oval prosthesis. This index is 1.2 time less after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis.

KI (the index of keratinization) is 2.5 times more after placement of saddle shaped prosthesis ($p<0.05$), than after placement of contact prosthesis, and 1.7 times more ($p<0.05$), than after placement of oval prosthesis. This index is 1.5 time less after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis

ID (the index of destruction) does not differ between the patients after placement of metaloceramic prosthesis with saddle shaped, contact and oval intermediate parts ($p<0.05$).

IDI (the index of inflammation-destruction) is 1.4 less after placement of saddle shaped prosthesis ($p<0.05$), than after placement of contact prosthesis, and 1.6 times less ($p<0.05$), than after placement of oval prosthesis. This index is 1.2 time less after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis.

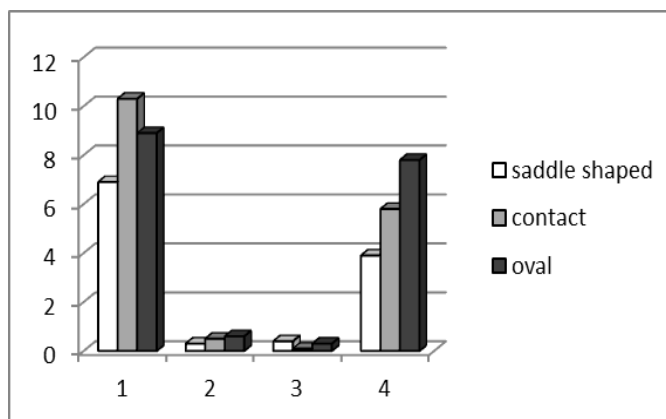
The comparative study of cytological data in the patients of subgroup I.II (patients with the low indexes of destruction and inflammation-destruction) 3-6 months after placement of metaloceramic prosthesis with saddle shaped, contact and oval intermediate parts has showed that:

1. CDI (the index of cell differentiation) is 1.5 times less after placement of saddle prosthesis ($p<0.05$), than after placement of contact prosthesis, and 1.3 times less ($p<0.05$), than after placement of oval prosthesis. This index is 1.2 time more after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis.

2. KI (the index of keratinization) does not differ after placement of saddle shaped prosthesis and contact prosthesis ($p<0.05$), and 1.8 times less ($p<0.05$), than after placement of oval prosthesis.

3. ID (the index of destruction) is 3.5 times more after placement of saddle shaped prosthesis ($p<0.05$), than after placement of contact prosthesis, and 1.4 times more ($p<0.05$), than after placement of oval prosthesis. This index is 2.5 time less after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis

4. IDI (the index of inflammation-destruction) is 1.8 less after placement of saddle shaped prosthesis ($p<0.05$), than after placement of contact prosthesis, and 2.4 times less ($p<0.05$), than after placement of oval prosthesis. This index is 1.3 time less after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis.



The cytological results of mandibular mucosa.

The comparative study of cytological data in the patients of subgroup I.I (patients with the high indexes of destruction and inflammation-destruction) 3-6 months after placement of metaloceramic prosthesis with saddle shaped, contact and oval intermediate parts has showed that:



1. CDI (the index of cell differentiation) is 1.1 times more after placement of saddle prosthesis ($p<0.05$), than after placement of contact prosthesis, and 1.5 times less ($p<0.05$), than after placement of oval prosthesis. This index is 1.7 time less after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis.

2. KI (the index of keratinization) does not differ after placement of saddle shaped prosthesis and contact prosthesis ($p<0.05$), and 1.5 times less ($p<0.05$), than after placement of oval prosthesis.

3. ID (the index of destruction) does not differ after placement of saddle shaped prosthesis and contact prosthesis ($p<0.05$), and 1.4 times more ($p<0.05$), than after placement of oval prosthesis.

4. IDI (the index of inflammation-destruction) is 1.5 less after placement of saddle shaped prosthesis ($p<0.05$), than after placement of contact prosthesis, and 1.2 times more ($p<0.05$), than after placement of oval prosthesis. This index is 1.8 time more after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis.

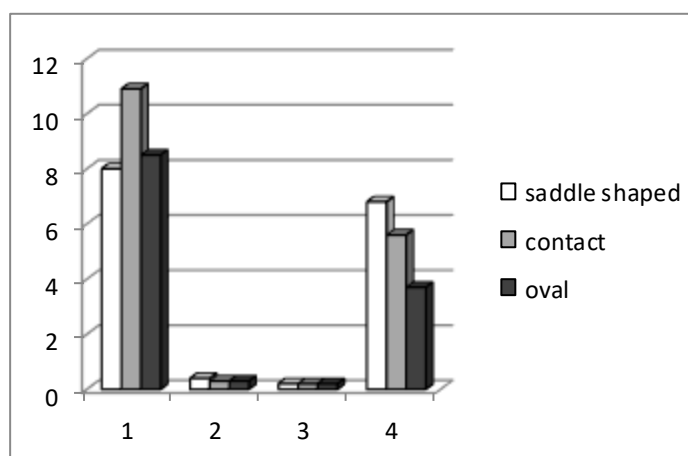
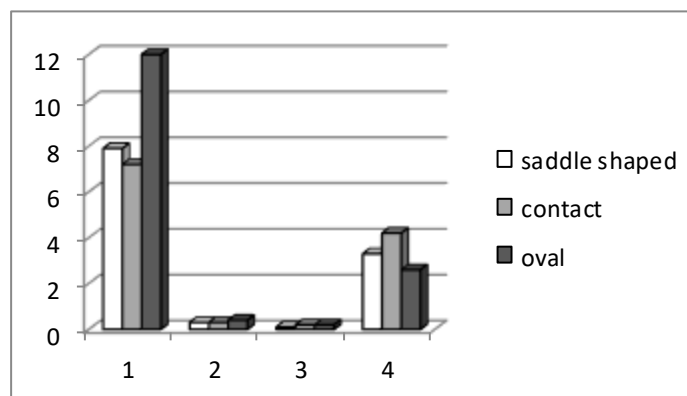
The comparative study of cytological data in the patients of subgroup I.II (patients with the low indexes of destruction and inflammation-destruction) 3-6 months after placement of metalloceramic prosthesis with saddle shaped, contact and oval intermediate parts have showed that:

1. CDI (the index of cell differentiation) is 1.3 times less after placement of saddle prosthesis ($p<0.05$), than after placement of contact prosthesis, and 1.1 times more ($p<0.05$), than after placement of oval prosthesis. This index is 1.3 time less after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis.

2. KI (the index of keratinization) does not differ after placement of saddle shaped prosthesis and contact prosthesis ($p<0.05$), and 2 times less ($p<0.05$), than after placement of oval prosthesis.

3. ID (the index of destruction) is 1.3 times more after placement of saddle shaped prosthesis ($p<0.05$), than after placement of contact prosthesis, and 1.3 times less ($p<0.05$), than after placement of oval prosthesis. This index is 1.7 time less after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis

4. IDI (the index of inflammation-destruction) is 1.3 more after placement of saddle shaped prosthesis ($p<0.05$), than after placement of contact prosthesis, and 2 times more ($p<0.05$), than after placement of oval prosthesis. This index is 1.5 time more after placement of contact prosthesis ($p<0.05$), than after placement of oval prosthesis



Discussion: In everyday practice, dentists regularly come across patients who have lost one or more teeth and therefore suffer numerous aesthetic and functional unwanted effects that affect their overall health and masticatory function. A possible treatment for these patients are fixed partial dentures (FPD), which are intended to restore lost teeth structure by means of all-metal, metal-ceramic, or all-ceramic restorations. [1] Unfortunately, these restorations are not without cost as these often extend into the gingival sulcus and come in contact with gingival epithelial cells.[5] An important aspect of stratified squamous epithelia is that the cells undergo a terminal differentiation program that results in the formation of a mechanically resistant and toughened surface composed of cornified cells that are filled with keratin filaments and lack nuclei and cytoplasmic organelles. In these squames, the cell membrane is replaced by a proteinaceous cornified envelope that is covalently cross linked to the keratin filaments, providing a highly insoluble yet flexible structure that protects the underlying epithelial cells.[7] Hyperkeratinization is the defect of epithelial cells. Normally, these epithelial cells shed or de-squamate at regular intervals. In hyperkeratinization, this process is disturbed because of an excess of keratin formation and accumulation due to lack of adequate desquamation. It occurs as a secondary reaction to chronic irritation or some infection or malignancy. Hyperkeratinization which occurs because of chronic irritation is due to higher rate of proliferation of the epithelial cells. [8] The adaptation of dental crowns and bridges to the supporting prepared crowns is less than perfect, always creating a gap that promotes bacterial colonization. Microcracks in the structure of these restorations will also do the same. The changes in oral microbial flora due to fixed restorations are well documented in literature; however, their effects may be underestimated in patients with systemic diseases.[9] The success of fixed dental prosthesis depends on many factors which should be considered during treatment planning. Tooth decay, gingival inflammation and periodontal disease are quoted as the most common biological complications of fixed dental prosthesis. It is well known that these conditions are caused by bacteria settled in the dentogingival plaque accumulated due to insufficient oral hygiene, and consequently, for oral health the appropriate hygiene regime is crucial. The relationship between bacterial plaque accumulation and gingival inflammation has been well documented. [10] Biologic nature of the oral cavity qualifies it to be an active environment for the corrosion of metallic alloys that have low mechanical and biological properties.[11] corrosion may adversely influence the mechanical integrity and biocompatibility, leading to compromised esthetics, physical weakness, and health hazards.[12] Leakage of ions will cause a wide range of biological interactions. The subsequent soft-tissue response can promote the adhesion of bacteria and lead to toxic or subtoxic effects or allergic responses. Many studies and research works have already demonstrated these mechanisms. Mechanical trauma due to pressure and friction between appliances and tissues can also lead to local tissue reactions. An immunological response may occur locally, leading to oral discomfort that may be manifested clinically as lichenoid reactions and stomatitis. A systemic reaction may develop, eventually leading to delayed hypersensitivity. Many studies and research works have already demonstrated these mechanisms. Mechanical trauma due to pressure and friction between appliances and tissues can also lead to local tissue reactions. [9]

Presented review of the literature revealed possible causes of changes of the gingival mucosa induced by a fixed metal-ceramic prosthesis. Used cytological indexes perfectly reflect the cellular changes of the gingival mucosa after placement of metallo-ceramic prosthesis. It is notable that cytological data differs when using metaloceramic prosthesis with different shaped intermediate parts (saddle, contact and oval), as well as between the maxillary and mandibular mucosa.

The presented study showed that:



- ❖ The cytological results of maxillary mucosa reveals that placement of metal-ceramic prosthesis with contact intermediate parts has more significant positive dynamic changes, in comparison to prosthesis with saddle shaped and oval intermediate parts
- ❖ After placement of mandibular metaloceramic prosthesis with oval intermediate parts we found more significant positive dynamic changes in cytological indexes when compared to prosthesis with saddle shaped and contact intermediate parts

Conclusions: Cytological examination of the gingival mucosa revealed changes not only after placement of fixed metaloceramic prosthesis but also differences in cytological data between maxillary and mandibular mucosa. Based on the results of cytological examination we can formulate the following recommendations:

1. Prior to use metaloceramic prosthesis with variously shaped intermediate parts, cytological examination of gingival mucosa is recommended including estimation of indexes of destruction and inflammation-destruction. This is important for evaluation of final results of orthopedic treatment.
2. Based on cytological changes of gingival mucosa metaloceramic prosthesis with saddle shaped intermediate part should not be used for mandible.
3. According to cytological examination of adjacent gingival mucosa, metaloceramic prosthesis with oval intermediate part is the best for mandible.
4. According to cytological examination of adjacent gingival mucosa, metaloceramic prosthesis with contact intermediate part is the best for maxilla

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ATOPIC DERMATITIS / ECZEMA TREATMENT WITH THE MESENCHYMAL STEM CELLS

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ABSTRACT

Mesenchymal stem cells (MSCs) possess unique immunomodulatory properties which make them a promising tool for the treatment of various inflammatory diseases. Our recent preclinical and clinical studies have shown that MSCs can be successfully used for the treatment of atopic dermatitis (AD)/Eczema.

Keywords: mesenchymal stem cells; atopic dermatitis; Eczema

Introduction: Atopic Dermatitis AD, also referred to as atopic eczema, is a representative inflammatory dermatopathy that features eczematous skin lesions with nasty pruritus, resulting from abnormal allergic immune responses against certain types of antigen, so-called “allergens”. It is estimated that AD affects approximately up to 20% of children [1] and 10% of adult [2]. Patients with AD, particularly in moderate-to-severe type, commonly suffer from significant sleep disturbance, depression and anxiety, which inflicts considerable psychological and socioeconomic burdens on patients and their families [3]. Clinical symptoms vary from almost subclinical to persistent disease with concomitant other allergic disorders including allergic rhinitis, asthma, and food allergy [4].

The principal peculiarities of AD pathophysiology include disruption of skin barrier function and excessive cutaneous inflammation [5]. Frequently, immunologic mechanisms of AD are characterized by dominant Th2-mediated abnormal inflammatory responses and elevated serum immunoglobulin E (IgE) and eosinophils. Moreover, it has been recently reported that other Th cell subsets might contribute to the pathogenesis of AD [6]. It is now accepted that Th2 and Th22-driven inflammatory responses are responsible for acute AD, whereas chronic AD is mediated by Th1 responses.

Along with T lymphocytes, DCs are known to act as a major cellular player in the pathogenesis of AD. Several types of DCs expressing high affinity IgE receptors (Fc ϵ RI) including Langerhans cells and inflammatory dendritic epidermal cells (IDECs) are increased in AD lesion, which facilitates allergen uptake and T cell responses. MCs as well as DCs express Fc ϵ RI and specific IgE-bearing MCs, called sensitized MCs, are abundant in AD lesion. Upon exposure to the specific allergen, IgE-mediated MC degranulation results in the release of preformed inflammatory mediators, such as histamine, serotonin, PG and leukotrienes, which contribute to disease exacerbation through the itch-scratch cycle and inflammatory processes through the recruitment of eosinophils and lymphocytes into the dermis [6].

Methodology: Despite the development and application of intensive treatments including biologic targeted therapies like dupilumab (anti-interleukin (IL)-4 receptor), AD cannot be cured completely

at present. Therefore, several studies have examined the therapeutic effects of MSCs against AD-like symptoms in experimental animal models. Na et al. demonstrated that IV injected syngeneic and allogeneic BM-derived clonal MSCs (cMSCs) can attenuate the severity of ovalbumin (OVA)-induced murine AD by reducing the infiltration of immune cells and IL-4 expression in the skin lesions and down-regulating the serum IgE level. Inhibition of T cell function via direct cell contact and nitric oxide (NO) production as well as suppression of IgE production through inhibition of class switch DNA recombination (CSR) were proposed as principal mechanisms of cMSCs. Considering the results of other studies that MSCs can attenuate allergic airway inflammation by inhibiting the Th2 cell activities [7], it seems that this mechanism is consistent in the treatment of AD. More recently, our previous study showed that hUCB-MSCs exert significant protective and therapeutic effects against *Dermatophagoides farinae* (Df)-induced murine AD by inhibiting MC degranulation. Particularly, local SC injection of MSCs exhibited more remarkable therapeutic potential in AD mice compared with IV administration. PGE2 and TGF-1 secreted by hUCB-MSCs are responsible for the suppression of MC degranulation and Fc ϵ RI expression, respectively. Since MC is the core responder cells in allergic responses and Th2-driven inflammation, regulation of MC function including histamine release can be a potential target of MSC therapy. Moreover, in the same mouse model of AD, we also demonstrated that IV infused hAT-MSCs significantly reduced the disease severity through the suppression of B cell proliferation and maturation, and this effect was mediated by cyclooxygenase 2 (COX-2) signaling [8]. Although T cells are core effector cells in the pathogenesis of AD, B cells also exist in AD skin lesion and have a considerable role in antigen presentation to Th cells and IgE production. Later on, the therapeutic efficacy of hUCB-MSCs was consistently confirmed by clinical trials (phase I/IIa) with moderate-to-severe AD patients [9].

Results: The single SC administration of hUCB-MSCs showed dose-dependent clinical efficacy in AD manifestation. Namely, 6 out of 11 (55%) patients in high dose hUCB-MSCs (5 10⁷ cells)-treated group exhibited a 50% reduction in the Eczema Area and Severity Index (EASI50) without any noteworthy side effects [10]. This is so far the only and first-in-class clinical study demonstrating efficacy and safety of allogeneic MSC therapy for patients with AD. However, further clinical studies with more patients and placebo group as well as mechanistic investigations verifying the mechanisms of crosstalk between MSCs and disease-related immune cells would make up the current lack of knowledge in this field.

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CLINICAL POTENTIAL AND MODE OF ACTION OF MESENCHYMAL STEM CELL DURING PSORIASIS

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ABSTRACT

Inflammatory skin disorders that cause serious deterioration of the quality of life have become one of the major public concerns. Despite their significance, there is no fundamental cure to date. Mesenchymal stem cells (MSCs) possess unique immunomodulatory properties which make them a promising tool for the treatment of various inflammatory diseases.

Keywords: Psoriasis, Immunomodulatory, Mesenchymal stem cells

Introduction: Psoriasis is a common chronic autoimmune disease manifesting mainly in the skin and joint, or both, which affects approximately 2%–4% of the worldwide population. Along with AD, psoriasis is regarded as the most important and notable inflammatory skin disorder[1]. As its complexity beyond skin damages, patients with psoriasis have a higher risk of the systemic comorbidities, including psoriatic arthritis, metabolic syndromes, and lymphomas, which increases the disease burden [2]. Psoriasis is usually classified into five types according to the clinical manifestations. Psoriasis vulgaris, also known as plaque psoriasis, is the most common type of psoriasis characterized by clearly demarcated erythrosquamous plaques with silvery-white scales on the surface. Since it makes up approximately 80% of cases, psoriasis is primarily regarded as a dermatologic disease. Psoriasis vulgaris can affect any location of the whole body surfaces, but major predilection sites are forearms, shins, around the anus and navel, the back of joints and scalp[3]. The pathogenesis of psoriasis is represented by DCs and T cell-mediated immune responses with complex cellular networks including macrophages, keratinocytes and neutrophilic granulocytes. Particularly, Th1 and Th17 subsets are widely considered the primary effector cells in psoriasis.

In the early stage of psoriatic skin, dermal plasmacytoid DCs produce interferon (IFN-) in response to complexes of host self-DNA and the epidermis-produced antimicrobial peptide LL-37 (cathelicidin)[4], which stimulates dermal DC activation and migration into lymph nodes (LNs). Subsequently, activated dermal DC-derived IL-12 and IL-23 drive the differentiation of Th1 and Th17 cells, leading to the onset of psoriasis. In addition, tumor necrosis factor (TNF-) secreted from activated dermal DCs as well as other types of immune cells[5], including macrophages, lymphocytes, keratinocytes and endothelial cells, results in the disease aggravation. Recent progress in the understanding of the pathogenic immune mechanisms of psoriasis has accelerated the development of newly emerged biologic therapies[6]. Ustekinumab, a human monoclonal antibody that targets IL-12 and IL-23, has been reported to have more striking efficacy



for the treatment of adult patients with moderate-to-severe psoriasis than anti-TNF-drugs. However, repeated administration over several months is necessary for achieving sufficient efficacy.

Methodology: There have been several attempts to apply allogeneic or autologous HSCT to patients with severe psoriasis and comorbidities over the last two decades[7]. However, HSCT has been reported to have a greater risk of developing secondary autoimmune diseases, such as thyroiditis, myasthenia gravis, ulcerative colitis and insulin-dependent diabetes mellitus. Based on accumulated results[8], MSCs obtained from patients with psoriasis have been shown to have impaired anti-inflammatory function against Th cell subsets [9], suggesting that allogeneic MSC therapy is expected to be beneficial in treating psoriasis. However, few studies have shown the efficacy of MSCs as a therapeutic agent against psoriasis. Our previous preclinical study demonstrated that subcutaneous infusion of hUCB-MSCs efficiently attenuates imiquimod (IMQ)-induced psoriasis-like skin inflammation in mice by suppressing Th1, Th2 and Th17 differentiation and up-regulating Treg population. Psoriatic mice administered with MSCs exhibited the decreased skin ROS level and immune cell infiltration into the skin lesions. Moreover, the therapeutic effect of MSCs can be remarkably enhanced by the overexpression of superoxide dismutase 3 (SOD3), a strong antioxidant enzyme. In particular, SOD3-transduced as well as naïve MSCs sufficiently inhibited the differentiation of Th17 and production of IL-17 and IL-22 [10].

Conclusion: According to the NIH ClinicalTrials.gov database, the only clinical trial (NCT02491658) is currently underway using UC-MSCs for patients with moderate-to-severe psoriasis vulgaris. Based on early results of this clinical study, both patients infused with UC-MSCs remained relapse free of psoriasis for four to five years [11]. An additional case report from the Philippines showed that IV injection of autologous AT-MSCs significantly improved the severity of psoriasis vulgaris similar extent to methotrexate treatment for 292 days without serious adverse events [12]. Although these results are not sufficient to conclude the efficacy and safety of MSCs due to the restricted number of cases, they suggest the possibility that MSCs can be effectively used in psoriasis as reported in other autoimmune diseases.

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THE THERAPY WITH THE MESENCHYMAL STEM CELL DURING CUTANEOUS LUPUS ERYTHEMATOSUS AND SYSTEMIC SCLEROSIS

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ABSTRACT

Mesenchymal stem cells (MSCs) possess unique immunomodulatory properties which make them a promising tool for the treatment of various inflammatory diseases. Our recent preclinical and clinical studies have shown that MSCs can be successfully used for the treatment of atopic dermatitis (AD), one of the major inflammatory skin diseases.

Introduction: Lupus erythematosus (LE) is a multifarious immune-mediated disease with a broad spectrum of clinical presentations provoked by impairment of self-tolerance and autoimmunity. Clinical manifestations of the disease may affect multiple tissues and organs, including the renal, neural, cardiovascular, musculoskeletal and cutaneous system with varying degrees of severity. Although the mainstay of investigations has primarily focused on SLE with renal injury due to its clinical severity, there have been increased investigations demonstrating the importance of and interest in cutaneous LE (CLE). Cutaneous lesions may occur as either primary signs without systemic manifestations or as one of the comorbid symptoms associated with SLE, the most severe form of LE accompanying lethal multi organ damages. Although the precise immunological pathogenesis of CLE has yet to be fully elucidated, complex cascades of native skin cells, such as endothelial cells and keratinocytes, and immune cells, especially Th1 cells, neutrophils and polyclonal B cells, are known to be implicated in cutaneous inflammation. Particularly, a hallmark of the CLE pathophysiology is the abnormal production of autoreactive antibodies against nuclear antigens, including RNA-binding proteins, double-stranded DNA (dsDNA) or chromatin-associated proteins, which is primarily mediated by aberrant T and B cell responses [3,4]. Moreover, disturbances in apoptotic process responsible for the clearance of dead cells cause the release of these nuclear antigens into the extracellular space, leading to the formation and deposition of immune complexes in target tissue [5]. Fas mutated MRL/lpr and NZB/W F1 mice have been widely used as experimental animal models of SLE to explore the therapeutic potential of MSCs. Indeed, IV administration of allogeneic

Methodology: MSCs efficiently improved multiorgan dysfunction in both MRL/lpr mice [7] and NZB/W1 F1 mice [6]. Although these studies exhibited the in vivo therapeutic effects mainly limited to nephritic exacerbations, lupus mice received MSC treatment commonly showed the down-regulated B cell activation and maturation and the reduced circulating autoantibodies. With regard to B cell function, a number of studies conducting under in vitro co-culture conditions have revealed that MSCs generally exert the suppressive effect on B cells. In fact, MSCs inhibit B cell proliferation through cell cycle arrest in the G0/G1 phase without the induction of apoptosis [and

suppress maturation of B cells to plasma cells, antibody secretion and the expression of chemokine receptors on B cells through direct cell contact [99] or soluble mediators [98]. In addition, several reports have been proposed that T cells are needed for the MSC-mediated B cell suppression [8], whereas contradictory result have been also documented that hAT-MSCs can directly induce IL-10-secreting regulatory B (Breg) cells to reduce plasmablast formation [8] (Figure 1 and Table 3). Based on these B cell inhibition effects, it is speculated that MSCs might be effective for attenuating CLE as well as SLE. MSC-based therapies have shown the significant clinical remission in patients with refractory SLE including skin manifestations. Liang et al. found that IV infusion of allogeneic BMSCs remarkably ameliorated the severity of nephritic and cutaneous manifestations. Among eight SLE patients with skin involvement, four patients achieved CR at one-month follow-up and skin symptoms of the other four patients also gradually faded after three months from MSC administration [9].

Conversely, Carrion et al. reported that transplantation of autologous BMSCs up-regulated circulating Treg population but failed to achieve clinical benefit in two patients with SLE. Moreover, considering the result that disease relapse can occur in several patients with active and refractory SLE after 6 months from a prior allogeneic UC-MSC-driven clinical remission, further investigations are required to ascertain the precise efficacy of MSC injection and its long-term safety. Nonetheless, these results support the strong evidence that MSC-based therapy may produce the beneficial outcome for patients with refractory SLE, including CLE.

Systemic Sclerosis/Scleroderma: SSc or scleroderma is a rare rheumatic disease of connective tissues accompanied by autoimmunity, vasculopathy and progressive skin fibrosis caused by excessive collagen deposition. Distinct skin lesions of the finger such as tightening and Raynaud's phenomenon are the clinical signature of SSc, but multiorgan complications, typically pulmonary fibrosis, can be accompanied, which aggravate the disease progress to the life-threatening condition. SSc is largely classified into two subtypes according to the extent of skin involvement. The limited form of SSc affects only the skin of distal extremities and face, whereas diffused or generalized form encompasses a wide range of visceral manifestations as well as more severe skin fibrosis. Although the pathogenesis of SSc is so far poorly understood, interactions between vascular, immunological and fibrotic processes are regarded as the main pathogenic factors responsible for the clinical manifestations in SSc. Firstly, environmental factors or genetic predisposition can cause endothelial damages and vascular injuries, leading to the secretion of various cytokines and mediators. In turn, these molecules can result in the impairment of innate and adaptive immune system, including the production of autoantibodies, mononuclear cell infiltration and dysregulation of cytokine production. Diverse mediators secreted from endothelial cells and activated immune cells, such as endothelin-1 (ET-1), platelet-derived growth factor (PDGF), TGF and IL-4, induce fibroblast activation and extracellular matrix compound (ECM) deposition. Particularly, the immunological responses in patients with SSc are predominated by Th2 cells and relevant cytokines like IL-4 and IL-13, which contributes to the formation of pro-fibrotic microenvironment [9]. Because of the diversity of clinical features and complexity of pathogenesis, satisfactory therapeutic approaches for SSc are currently not available. In common with other autoimmune diseases, in spite of remarkable advances in the development of therapeutic strategies, SSc still remains an intractable disease with high morbidity and mortality [10]. Although several studies have shown the marked therapeutic potential of BMSCs and UC-MSCs in bleomycin-induced rodent SSc models, these



results have been limited only to anti-fibrotic effects against the lung fibrosis and injuries but not the systemic manifestations including cutaneous scleroderma. Recently, a new animal model induced by repeated application of hypochlorous acid (HClO) has been developed to examine the therapeutic effects of MSCs. As this model reflects the role of free radicals in disease progress, this model can mimic the diffuse form of human SSc more accurately. Maria et al. reported that IV injection of allogeneic BMSCs exerted significant preventive and therapeutic effects on HClO-induced murine SSc. They also showed the pleiotropic effects of MSCs, including anti-fibrotic, anti-oxidant and immune-modulatory capabilities for skin lesions as well as lung injuries. In a genetic model of SSc, Akiyama and colleagues found that allogeneic BMSCs remarkably reduced hyperdermal thickness and autoantibodies, and MSCs-mediated T cell apoptosis by FAS/FAS Ligand death pathway triggered macrophages to produce TGF-1 leading to up-regulation of Treg population. This mechanism of action was consistently confirmed in patients with SSc using allogeneic UC-MSCs.

Conclusion: MSC-based cell therapy has been spotlighted as a promising approach for the treatment of inflammatory skin disorders, and relevant clinical trials are ongoing. We have highlighted the current knowledge about the interaction between MSCs and immune responses in inflammatory microenvironment of various dermatoses.

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READABILITY OF ONLINE MEDICAL INFORMATION TEXTS ABOUT SCABIES IN TURKISH PROFESSIONAL MEDICAL WEBSITES

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ABSTRACT

Introduction: Scabies is a very common community health problem. A sprawling pruritus in a family or a crowded working area makes the people think of a possible scabies. Internet is the easiest way to collect any information in this century. Everyday more patients use internet search engines to gain information about their diseases and the treatment options. The aim of this study to assess the readability of the texts about the scabies in professional Turkish websites.

Methods: The keyword ‘‘uyuz’’ meaning ‘‘scabies’’ in Turkish language was written on search engines Google and Yahoo. The websites written by healthcare experts for public consumption were chosen. The newsportal websites, websites of non-health care experts and websites of government affiliations were excluded.

Results: 37 websites having the including criteria were evaluated. 33 (89%) website were giving the information of topical drug use. The information of active drug ingredient was detected. Only 9 of 37 (24%) websites were giving this information. According to this rating none of the studied texts were in very easy nor easy levels. 21 of the texts were with medium difficulty, 15 of them were hard to read, 1 of them were very hard to read.

Conclusion: It’s not easy to reach a medical professional in a short time. In this study it was aimed to search the healthcare professionals’ websites to determine their readability levels for readers searching for scabies in Turkish websites. Most of them were hard to read. They had complex long sentences. But most of them were giving enough information about scabies transmission and prevention ways. This is essential for preventive medicine and community health care.

Keywords: readability, scabies, internet, websites

Introduction: Scabies is a very common community health problem. Sudden starting body pruritus in a family or a crowded working area suspects people to have possible scabies.

Everyday more patients use internet search engines to collect information about their diseases and the treatment options.¹ However online medical texts can be hard to understand for patients having low health literacy.²

The initial studies about the readability were designed in 9th century in holy texts to distinguish the less important points from the dominant messages.³ Keating was the first to investigate over 11 billions words about readability in English.⁴ There has been so much studies since that time. Ateşman formula was created as the first Turkish readability formula created for readability of texts in Turkish. It was an adapted form of FRES formula in English.³

The aim of our study to assess the readability of the texts about the scabies in professional Turkish websites.

Methods: The keyword ‘‘uyuz’’meaning ‘‘scabies’’ in Turkish language was written on search motors Google and Yahoo. 1.500.600 results were found in Google, 2.260.000 results were found in Yahoo (Table 1).

Table 1. Number of keyword results on search motors

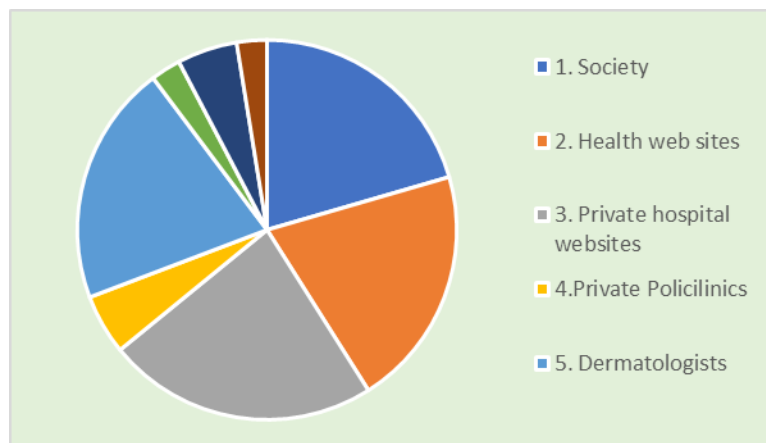
Search engine	Results
Google	1.500.600
Yahoo	2.260.000

The websites written by healthcare experts for public consumption were chosen. These websites were as non-governmental hospital websites, professional health care societies’ websites, medical blogs with anonymous medical writers, medical blocks from specific medical doctors. The newsportal websites, websites of non-health care experts and websites of government affiliations were excluded. After 23th page of Yahoo and 25th page of Google no more new sites were seen. The pages were repeating the initial pages. The total remaining 37 websites having the including criteria were evaluated.

Atesman formula was used to evaluate the readability. Atesman formula was modified from FRES formula and adapted to Turkish^{5,6}

Atesman score= $198.825 - 40.175 \times (\text{total syllables}/\text{total words}) - 2.610 \times (\text{total words}/\text{total sentences})$ ⁵
The medical information texts were copied to Microcoft Office Word program. The number of sentences, words and syllables of each text were calculated. The results were noted on Microsoft Excel program. Total amount of sentences, words and syllables were calculated. The websites of non-governmental hospital websites, professional health care societys’ websites, medical blogs with anonymous medical experts, medical blocks from specific medical doctors with different specialities of medicine were evaluated. The website information of scabies transfer ways and symptoms, the drug use information, information of drug active ingredient name were recorded for evaluation.

Results: The websites using the keyword were determined. 9 of them were Private hospital websites, 8 of them were Professional Health Care Societies websites, 8 of them were Professional Health Care Websites, 8 of them were private dermatology specialist’ website, 1 of them was private gynecology specialist’s website, 2 of them were private peditary specialists’ website, 1 of them was family medicine specialist’ website(Figure 1).

**Figure 1.** Types of websites

In the Atesman's Formula there are 5 levels of readability in Turkish language text giving information about for scabies from very easy to very hard levels (Table 2).

Table 2. Atesman Readability Levels

Atesman Readability Levels	
Very easy	90-100
Easy	70-89
Medium difficult	50-69
Hard	30-49
Very hard	1-29

According to this rating none of the studied texts were very easy nor easy. 21 of the texts were with medium difficulty, 15 of them were hard to read, 1 of them were very hard to read. (Figure 2)

Some criteria were searched for being guide to reader in the texts. Information about the transmission route of scabies parasites were detected. All the texts were giving this information. The description of topical drug use were detected. 33 (89%) website were giving the information of topical drug use. The information of active drug ingredient was detected. Only 9 of 37 (24%) websites were giving this information.

The mean ratio of number of words to sentences in texts were varying from 7,729 to 16,833. The text with the least mean was in medium difficulty level for readability. The highest word to sentence ratio text was in hard readability level.

The mean number of syllables to words ratio was varying from 2,674 to 3,267. The text with least ratio value of syllables to words was in medium difficulty reading level. The highest syllable to word ratio text was in hard level in readability.

Discussion: Scabies is a common infestation with a worldwide distribution. It can have outbreaks especially through the nursing care homes, in families or crowded dormitories.⁷ Scabies is caused by a mite called *Sarcoptes Scabiei*. Its major symptom is intense pruritus and arise usually in 2-6 weeks.⁸ Its transmission occurs usually with direct contact. Indirect contact transmission is less, but possible. The parasite dies in 2-3 days in room temperature on objects like furniture, if there is no transmission to a human body.

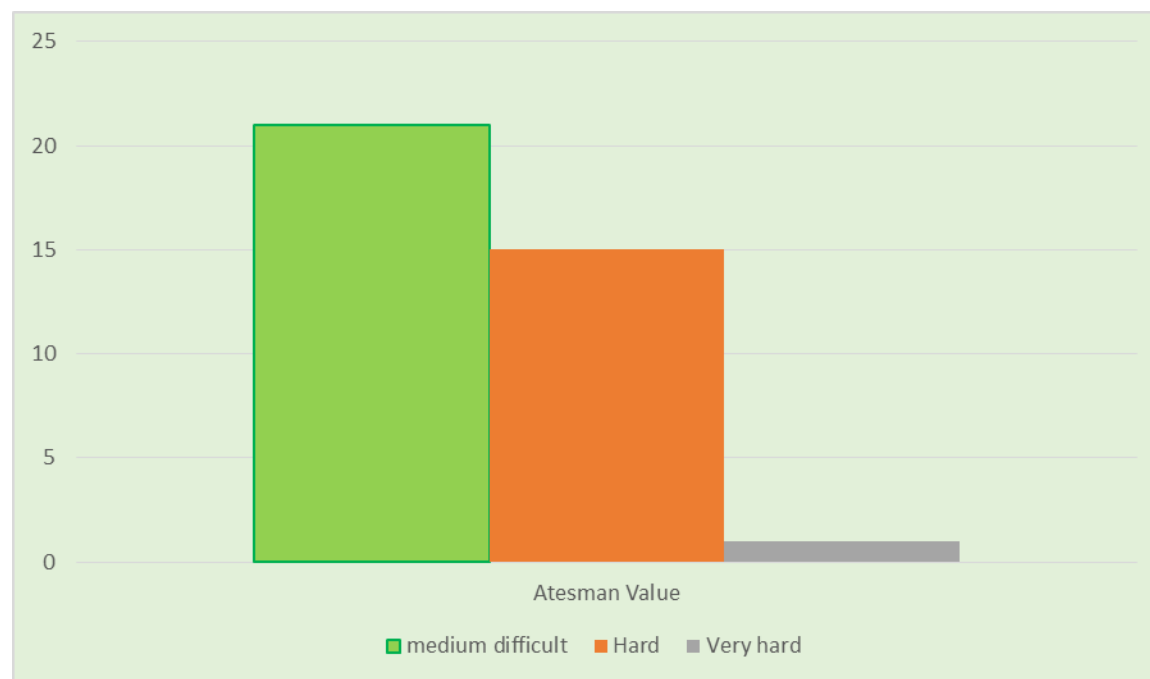
Permetrin, lindan and crotamiton are the most common used topical agents for scabies. In systemic treatment ivermectin used in a dose 200 µg/kg. Permetrin is the most effective topical agent. It's applied on the skin from neck to foot and left for 8-12 hours overnight.

It's important to be aware of scabies transmission ways if a family member or a close friend is having the disease.

Internet is the easiest way to gain information about a disease in this century. Because getting an appointment with a doctor can take days even weeks. The private health professionals having attention on information on internet websites give the patients an easy way to get a medical information.

In our study the readability levels of medical information texts in Turkish were usually in "medium difficult to read" level with Atesman's Readability Formula. There were no text in easy nor very easy level. (Figure 2). This shows that getting medical information on internet may not be easy for scabies for a person having poor medical literacy.

Figure 2. Readability Values due to Atesman Formula





All of the websites gave information about transmission way of the mite. This is helpful for people to learn prevention way. 33 of 37 sites (89%) website were giving the information of applying of topical drugs. These two information is important for preventive medicine.

Only 9 of 37 (24%) websites were giving the active ingredient information. This may be not effective for a writer aiming to help patients who can't to reach a doctor. So writing an information text is being ineffective in treatment side.

8 of the websites were private dermatology specialists' website, 1 of them was a private gynecology specialist's website, 2 of them were private pediatry specialists' website, 1 of them was a family medicine specialist's website. It shows that dermatologist having private health websites give enough attention for general dermatology subjects and diseases. In Eryılmaz's study about readability of skin cancer information texts 22 of 74 websites were prepared by dermatologist while most of these websites were prepared by other medical specialists.

Among 4 healthcare societies 2 of them were dermatology societies. One of the other society sites was clinical microbiology society, and the other one was pharmacy website. This is also very gladsome that professional healthcare societies are giving enough attention for scabies and giving enough attention as a public health problem.

Conclusion: Internet is the easiest way to gain any information in this century. Medical information is essential for everyone since most of the health problems are complex and having sites to be explained by a health care professional. But it's not easy to reach a medical professional in a short time. The financial problems or late appointment dates for face to face medical examination orients people to search on internet. There are lots of websites giving information created by non-healthcare professionals in internet. These sites and their texts may usually give wrong information and non-medical treatment options that can be dangerous to apply. In this study it was aimed to search the healthcare professionals' websites to determine their readability levels for readers searching for scabies in Turkish websites. Most of them were in "medium difficult to read" due to Atesman's Readability Formula. This may be because of long sentences which makes the readability hard. But most of them were giving enough information about scabies transmission and prevention ways. This is essential for preventive medicine and community health care. But people suffering from scabies and its intractable pruritus are better to have face-to-face physical examination because drugs must be modified by medical doctors.

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