

Review

Lifestyle, Quarantine, Diabetes and COVID-19

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Abstract

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The objective of this narrative review is to describe the complex, bi-directional relation between diabetes and COVID-19, with a special attention to quarantine period and lifestyle implications. The scope will be to draw attention through the importance of a healthy lifestyle implemented at populational level. A dramatic pandemic event raised at the beginning of 2020, COVID-19 became an important threat for health all over the world. COVID-19 occurs more frequently in patients with poor glycaemic control, and SARS-CoV-2 infection can cause loss of glycaemic control and can even induce severe ketoacidosis if blood glucose monitoring is inadequate and antidiabetic treatment is not adjusted if necessary. Main risk factors for COVID-19 are: age more than 65 years, comorbidities such as diabetes, hypertension, obesity, cardiovascular disease, chronic kidney, lung, liver diseases, etc. The occurrence of severe forms of COVID-19 in patients with diabetes (type 1, type 2, or gestational) may be due to the fact that over 50% of these patients have at least one of the comorbidities listed before. All patients diagnosed with COVID-19 will be screened for diabetes, as SARS-CoV-2 can destroy pancreatic β cells, and on the other hand, it can increase insulin resistance, causing new-onset diabetes. Moreover, all patients with COVID-19 will be monitored in the medium and long term, as they may develop insulin-dependent diabetes by triggering SARS-CoV-2 induced immune mechanisms. Described as "an obesogenic period" quarantine is favouring an unhealthy lifestyle, marked by anxiety. Recognized benefits of mandatory mass quarantine must be weighed against long term adverse effects mainly on cardiovascular risk burden. Social distance measures may induce stress, anxiety or even depression. Isolation, quarantine limits social interactions and may have consequences on weight both by energy intake and physical activity. In conclusion, the future will build more on healthiness, prevention and creating a healthy lifestyle.

Keywords: COVID-19, Diabetes, Lifestyle, Obesity, Quarantine

INTRODUCTION

COVID-19 became slowly in 2020 a pandemic disease, repeating other coronavirus infections experience before like the MERS-CoV or the SARS-CoV1 epidemic. The worldwide spread of this coronavirus tried to copy the flu symptoms but with more deadly consequences. The list of viral infections is quite long if we are thinking to the global public health crises in the last 20 years caused by HIV, Influenza A virus subtype H1N1, Influenza A virus subtype H5N1, SARS-CoV1, MERS-CoV, and Ebola. Every time the scenario was the same: lack of prepa-

redness for the health system, governments, authorities. On March 26, WHO (2020) defined and recommended six essential strategies: expand, train and deploy health-care workers; implement systems to find suspected cases; ramp up production of tests and increase availability; identify resources that can be transformed into coronavirus health centers; develop plans to quarantine cases, and refocus government measures on suppressing the virus. Every action seems to be necessary. The transparency remains the key to

managing pandemic as it provides a condition where infected persons can be quickly identified and treated accordingly in a timely fashion together with communication strategy (Seeger, 2006) that allows people to be informed to minimize any irrational behaviors such as anxiety, panicbuying on local markets. A proper communication plan from authorities will be helpful in order to implement better all measures. The talent of this virus is that it has managed to bring to the surface a multitude of important comorbidities that patients knew or did not know about. At the same time it decompensated some of these diseases and here diabetes was one of the diseases that appeared frequently associated. There are few studies looking to the quarantine period and diabetes evolution. More evidence are on the association of lifestyle risk factors, individually and, more recently, collectively, with the risk of mortality and chronic disease. Those with high risk factors are living 2 years less as those with all the described healthy lifestyle factors respected (May et al., 2015). The presence of at least 2 lifestyle risk factors versus no lifestyle risk factors are reducing the free period of chronic diseases an average with 6 years (Stenholm et al., 2016)

People with diabetes, a particular risk group? COVID-19 and diabetes are two mutually influencing diseases, both pandemic, the first one acute and infectious and the second one chronic and noncommunicable. COVID-19 occurs more frequently in patients with poor glycaemic control, and SARS-CoV-2 infection can cause loss of glycaemic control and can even induce severe ketoacidosis if blood glucose monitoring is inadequate and antidiabetic treatment is not adjusted if necessary (Hussain et al., 2020).

Diabetes as a risk factor. More and more publications, based on currently available information and clinical expertise, state the role of some risk factors in the occurrence of COVID-19, or the occurrence of severe forms, with increasing mortality. These risk factors are: older adults (more than 65 years) or people of any age, having other chronic diseases, such as diabetes, hypertension, obesity, cardiovascular disease, chronic kidney, lung, liver diseases, etc. The occurrence of severe forms of COVID-19 in patients with diabetes (type 1, type 2, or gestational) may be since over 50% of these patients have at least one of the pathologies listed before. Depending on the global region, 20 -50% of patients diagnosed with COVID-19 during the pandemic had diabetes. The published data so far on the increased frequency of COVID-19 in patients with diabetes are controversial. Still, it is unanimously accepted that patients with diabetes have more severe forms of the disease (including Adult Respiratory Distress Syndrome-ARDS and multiple organ failure), are more frequently hospitalized and have much higher mortality compared to the general population (Centers for Disease Control and

prevention, 2020; Ma and Holt, 2020).

Diabetes, Lifestyle and Treatment. Sedentary lifestyle, due to the need for isolation, diet modification (limitation of access), digestive disorders (caused by COVID-19 or recommended medication), anxiety, sleep disturbances, lack of access to drugs and medical care can create metabolic disorders. Metformin and GLP-1 RA may induce adverse digestive reactions, SGLT-2 inhibitors may promote dehydration; sulfonylurea may cause hypoglycemia; therefore, multiple-dose insulin therapy appears to be optimal in patients with Diabetes and COVID-19. Insulin administration attenuates also angiotensin-converting enzyme 2 (ACE2) expression. Poor glycemic control may induce a decreased immune response in patients with diabetes, causing severe viral infection and secondary bacterial superinfections. In diabetes but also in hypertension, there is a hyperactivation of the Renin-Angiotensin-Aldosterone System (RAAS). SARS-CoV-2 enters into the cells through ACE 2, the receptor for SARS-CoV-2, a crucial component of the RAAS, which is found in the lungs, heart, digestive tract, kidney, liver, pancreas, etc. This also explains the appearance of multiorgan dysfunction or insufficiency, in severe forms of COVID-19 (Centers for Disease Control and Prevention, 2020; Ma and Holt, 2020; Yang et al., 2020; Guan et al., 2020; Zhang et al., 2020). Over 60% of patients with diabetes are also hypertensive, and most of them are on treatment with ACE inhibitors or Angiotensin II Receptor Blockers (ARBs), which increase the expression of ACE2, favoring the intracellular viral uptake. In practice, however, no negative role of these therapeutic classes has been demonstrated, so they will not be replaced by other antihypertensive drugs (European Society of Cardiology Council on Hypertension, ESH and AHA) (Ma and Holt, 2020; European Society of Cardiology, 2020; European Society of Hypertension, 2020; Bozkurt et al., 2020; Gupta and Misra, 2020; Fang et al., 2020).

Diabetes comorbidities

Diabetes patients associate abdominal obesity in a high percentage, with sleep apnea, impaired secretion of adipokines and cytokines, immune disorders, and increased infections and asthma risk. Severe abdominal obesity may produce mechanical respiratory problems and reduces oxygen saturation of blood, increasing the risk of severe pneumonia. The most important pathophysiological mechanisms implicated to the increased morbidity and mortality of COVID-19 in people with diabetes are chronic inflammation, hypercoagulability, immune response impairment, the destruction of pancreatic β cell by SARS-CoV-2 (Hussain et al., 2020; Madsbad, 2020).

Diabetes- future approach

All patients diagnosed with COVID-19 will be screened for diabetes, as SARS-Cov-2 can destroy pancreatic β cells, and on the other hand, it can increase insulin resistance, causing new-onset diabetes. Moreover, all patients with COVID-19 will be monitored in the medium and long term, as they may develop insulin-dependent diabetes by triggering SARS-CoV-2 induced immune mechanisms (Bornstein et al., 2020).

The quarantine and other methods of distancing people

The coronavirus pandemic brought many actions of the majority of the governments. The quarantine strategy was integrated in the effort to curb the rapid spread of the virus. It was and remained an important method to deflect the prevalence of infections and viral disease. In many countries, the quarantine brought impressive data of lockdown people (1,7 billion people on March 26 (Jones and Kassam, 2020) and two days later, 2,6 billion worldwide) (Kaplan et al., 2020). Every delay of quarantine was a lesson for the future. Reaction of the governments where different. It was and resisted also as an important tool to control the pandemic evolution. There are many examples. In Wuhan, the epicentrum of infection 'lockdown' of the town, and subsequently a wider-scale 'lockdown' throughout Hubei province, began on January 23, 2020, and brought a daily rate of the spread below 10% from 50% growth in cases per day how it was before (ABC News, 2020). Italy (the second European epicenter of infection) registered a spectacular growing of detected case between 21-23 February (daily increases of 567%, 295% and 90% respectively). After February 2, 2020, a "cordon sanitaire" was imposed on a group of at least ten different municipalities in Northern Italy, quarantining more than 50,000 people (la Repubblica, 2020). Between February 29 and March 4, the daily increases were only 27%, 50%, 20%, 23% and 23% (Bartoloni, 2020). On Europe on March 18, more than 250 million people were in lockdown (Henley and Oltermann, 2020). Concerning estimations there are also many models of simulation of quarantine (Nussbaumer-Streit et al., 2020). Combined quarantine with other prevention and control measures, like school closures, travel restrictions and social distancing, had a larger effect on the reduction of new cases, transmissions and deaths than individual measures alone. Quarantine of people exposed to confirmed or suspected cases averted 44% to 81% incident cases and 31% to 63% of deaths compared to no measures based on different other scenarios with cost savings (Nussbaumer-Streit et al., 2020). Self-quarantine is another scenario. Health experts recommend that self-quarantine lasts fourteen days. Two weeks provides time for them to know whether

or not they will become ill and be contagious to other people. Quarantines and travel bans are often the first response against important viral infections. Still, these old tools are usually criticized and of limited utility for highly transmissible diseases, and if imposed with too heavy a hand, or in too hazard manner, they can be counterproductive (Gostin and Hodge, 2020).

How Lifestyle was Affected in Quarantine, Implications for Obesity

Obesogenic period

Quarantine period could be described as an "obesogenic period" favouring unhealthy lifestyle, marked by anxiety. Recognized benefits of mandatory mass quarantine must be weight against long term adverse effects mainly on cardiovascular risk burden (Mattioli and Ballerini Puviani, 2020). Stress, social distance measures may induce anxiety or even depression. Isolation, quarantine limits social interactions and may have consequences on weight both by energy intake and physical activity.

Stress and eating behaviors

Not completely understood is the relationship between stress and eating behaviors, stress leading to increased or decreased eating (Torres and Nowson, 2007; Laitinen et al., 2002). Binge eaters, compulsive eaters, stress eaters are more likely to eat hypercaloric food, high in saturated fat and high in sugar concentration. Emotionally, these types of foods may act as "comfort food" replacing emotional support from relatives or close friends. Not surprisingly, loneliness and isolation may be predictive for stress-driven eating, but also for "binge drinking" (Torres and Nowson, 2007; Laitinen et al., 2002).

Depression as a predictor for obesity

Fifteen studies, including 58745 people, evaluated in a systematic review concluded that depression is predictive for overweight or obesity development in women. [OR:1.11; CI 95%] and [OR 2.01CI 95%]. The explanation is simple and clear through the adoption of an unhealthy lifestyle, mainly by unhealthy eating models and lack of physical exercise, the right receipt for weight gain (Luppino et al., 2010).

Development of unhealthy lifestyle behaviors

The privation from freedom and high uncertainty about the disease evolution, supported by negative news,

represents the fundament for developing unhealthy behaviours (Mattioli and Ballerini Puviani, 2020).

Sedentarism

The first aspect is related to physical activity reduction, mainly outdoor, combined with increased in sedentarism periods. All benefits related to physical activity will be decreased, with consequences, both on short term and on a long time on health status. The adherence to physical activity at home is, by far, lower compared to routine activities in sports facilities. People are affected by isolation, and motivation to change physical activity habits is difficult. People need to be more creative in finding different solutions and inventing types of indoor activities they like to practice. With many restrictions in outdoor activities, sedentarism is increasing, in synergy with boredom, sadness and mindless eating. Evidenced in an important statement released by AHA's Science Advisory (Young et al., 2016) not just a lack of physical activity, sedentarism is an independent risk factor for stroke and heart disease. Prolonged sedentary time may negatively impact blood vessels and heart, leading to the advice "sit less and move more". Since 2009, dr Steve Blair considering results from Aerobic Center Longitudinal Study warned that "physical inactivity is the biggest health problem of the 21st century" (Blair, 2009). This study concluded that a higher importance has to be attributed to fitness versus fatness, proving that a better reduction in premature mortality has been observed due to cardiorespiratory fitness improvements compared to cholesterol and glycaemic levels reductions. Not surprising was the early conclusion that exercise is acting like a real medicine.

Moreover, these findings have been supported by Lee (2012) considering physical inactivity as a pandemic phenomenon, causing 1 in 10 premature deaths worldwide. When was done a comparison with smoking, numbers found were almost similar, drawing the conclusion that "sitting is the new smoking"(Lee, 2012). Regular exercises are efficient in the secondary prevention of coronary heart diseases and diabetes (Lee, 2012). Physical Activity Guidelines for Americans 2018 (Office of Disease Prevention and Health Promotion, 2018) is a comprehensive report that summarizes in a very documented manner, the whole scientific evidence about sedentarism, physical activity and exercise. The movement produced by skeletal muscles producing energy expenditure is defining physical activity. When this is structured, repetitive, planned, with the objective to increase or support physical performance and fitness, we are speaking about exercise, that can be of different intensity. Usually, the terms "exercise" and "physical activity" are referring to moderate or vigorous intensity. In contrast, sedentarism means any behaviour defined by an energetical expenditure below 1.5 Metabolic

equivalents METs, while 1 MET is the energy cost of sitting quietly consuming 1kcal/h (US Department of Health and Human Services, 2018).

Considering strong evidence relating prolonged sedentary time to the developed risk of type 2 diabetes, more attention has to be accorded to implement measures to discourage inactive periods and to encourage physical activity and exercise. Meanwhile, strong evidence correlating higher mortality rates due to cardiovascular diseases is supporting the same message. The obvious conclusion that the quarantine period is generating risk for chronic diseases, due to higher sedentary periods can be drawn. The same report is revealing that all-cause mortality is related not only to sedentarism but to the intensity and amount of physical activity. Even if sedentary periods are high, for people working at home in quarantine, for example, the higher amount of intense physical activity may compensate it. An impressive meta-analysis using data from 1 mil people has reported that the impact of sedentary behaviour on all-cause mortality could be reduced by growing the period of physical activity, at moderate to vigorous intensity (Ekelund et al., 2016). There need to be taken into consideration evidence about a higher percentage of fat mass and weight measurements indicators in direct relation with sedentary behaviour, even they are limited.

Sleep and physical activity

It is well known that active people function better, feel energized and sleep well. Is demonstrated already that the quality of sleep is improved by moderate or high-intensity physical activity. This is due to a regulation of sleep/awake schedule and increased deep sleep (US Department of Health and Human Services, 2018). Quarantine affected sleep and many insomnia episodes have been reported associated with psychological distress (Brooks et al., 2020).

Brain function

Memory, processing speed, attention, academic performance, as components of cognition are enhanced by physical activity. It has to be mentioned that by exercise, not only the risk of clinical depression is reduced, but also depressive symptoms and their severity. All physical activities are improving physical functions, allowing persons to have daily lived with energy instead of fatigue. Even single episodes of physical exercise enhance executive functions for a while, meaning the ability to organize daily activity and make plans for the future. Such important tasks like self-monitor, facilitate or inhibit behaviours, initiating projects, emotion control will be realized better by an active

Table 1. Physical activity and disease-related mortality or effect(US Department of Health and Human Services, 2018)

All-cause mortality	Lower risk due to physical activity
Cardiometabolic conditions	Lower cardiovascular incidence and mortality due to stroke and heart disease. Lower hypertension and type 2 diabetes incidence
Brain health	Improve cognitive function and quality of life, better sleep, decrease stress, anxiety, depression, both in healthy people and people with pre-existing altered conditions.
Weight gain	Support nutrition intervention for weight loss and prevent weight regain.
Hypertension	Cardiovascular disease progression is reduced and the risk of developing increased blood pressure in time is lower
Type 2 Diabetes	Decreased mortality due to cardiovascular co-morbidity. All disease indicators will be improved: Glycosylated hemoglobin, lipids, blood pressure and body mass index.

person (US Department of Health and Human Services, 2018).

All these proofs should create an essential motivation for practising daily physical activity, especially in quarantine period, quarantine has potential effects on cardiovascular risk increase, by unhealthy diet, depression, reduced physical activity, stress and anxiety. Spagnola epidemics in 1918 revealed an increase in deaths by cardiovascular events after that quarantine.

Psychological quarantine impact

Rubin and Wessely (2020) evidenced in a recent review, reported post-traumatic stress symptoms, anger and confusion. All these stressors are in relation to the duration of the quarantine period, boredom, frustration, financial loss, incomplete or erroneous information and infection fears (Rubin and Wessely, 2020). Primary supplies deficiency may be a source of frustration (WHO, 2017) and could be in the long term (4-6 months) associated with anger and fear (WHO, 2017; Bai et al., 2004). As a result, anxiety and unhealthy lifestyle may predict long term effects on cardiovascular disease. Table 1

Lifestyle as a tool to reduce morbidity and mortality from noncommunicable diseases

All these benefits associated with physical activity need to be promoted in order to prevent and decrease morbidity and mortality from noncommunicable diseases. But not only physical activity but all lifestyle components are important.

A relevant prospective study on 116043 people conducted by Solja T. Nyberg (2020) followed for 30 years revealed the association between the number of years free of chronic diseases and healthy lifestyle parameters. Chronic diseases evaluated were: type 2 diabetes, stroke, coronary heart disease, chronic obstructive pulmonary disease (COPD), asthma, cancer. Lifestyle factors estimated were: body mass index and physical

activity, alcohol consumption and smoking. There is a linear association between overall healthy lifestyle score and the number of free years, 1 point score improvement is associated with an increase in disease-free years by 0.89 in women and 0.96 in men. Additional 9.9 years in men and 9.4 years in women were added in those people with the highest score versus lowest score (Nyberg et al., 2020). This multicohort analysis associates healthy lifestyle with benefit in life years without developing major chronic diseases.

Twenty-six studies analysis showed an inverse relationship between weight gain and physical activity. Different types of physical activities have been assessed: household activities, recreational, occupational activities, walking and leisure time. All types of intensities have been researched (US Department of Health and Human Services, 2018).

Moreover, Rosenberg et al. demonstrated an inverse relationship between physical activity of different intensity and the chance of developing obesity. Obesity incidence was reduced significantly, gradually from 0.87 (95% CI: 0.81-0.93) at persons spending 1-2 h/ week, to 0.82, at the others performing 3-4 hours (95% CI: 0.75-0.88) and 0.79 at the level of 5-6 h / week (95% CI: 0.71-0.87), and 0.77 for more than 7h/week (95% CI: 0.69-0.85) (Rosenberg et al., 2013).

Not surprisingly, the message "exercise is medicine" developed as a tool for practitioners to motivate people to "move more and sit less". More and more, practitioners have to become "role models" for their patients in order to encourage them to exercise (Hâncu et al., 2019).

Jimenez is describing the physical activity as a real therapy in fighting against mental and physical consequences of COVID-19 quarantine (Jiménez-Pavón et al., 2020). They recommend that usual WHO recommendations for physical activity 150-300 min/ week aerobic and two resistance training/ week should be enlarged at 200-400 min/week, along seven days to compensate higher sedentary periods in quarantine. Exercise intensity should be moderate to vigorous as far as possible. For older people, medium intensity exercises may represent an ideal option, mainly by already proofed enhanced immunity (Jiménez-Pavón et al., 2020).

Nutritionist approach- mindful eating

In contrast with a recent study confirming 21% of Americans are eating in fast foods and restaurants, with high saturated fats, high calories, high sodium and sugars, home cooking creates the potential for healthy eating (Liu et al., 2020). In quarantine, people eat mainly at home and started cooking but not in favour of healthy options. People fear to go out for shopping limits the accessibility to fresh fruits and vegetables. Anxiety in predicting food shortages could make people select long-life food, preserved, packaged food replacing new healthy options. Nutritionists who make online consultations are emphasizing mindful eating, pointing out that following the regular schedule for consumption, bringing at home only healthy options, without super caloric foods or "comfort foods" and eating when we are hungry not to calm emotions, sit at the table, paying attention to diet, avoid snacking but also skipping meals (Durrer Schutz et al., 2019).

Nutrition for people already infected with COVID-19

Zhejiang University experience (Liang, 2020) is recommending for patients with mild or moderate evolution of COVID-19 which could receive oral feeding, to provide an energy level of 25-30 kcal/body kg. Protein intake should be higher compared to healthy levels for the general population, at the level of 1.2-2.0 g/body kg being suggested. They describe a dysbiosis (with a significant decrease in bifidobacterium and lactobacillus) associated with this illness, responsible for gastrointestinal symptoms, such as bloating, diarrhoea and abdominal distension. (Liang, 2020) Routine tests could not identify this dysbiosis, but performed nutrition clinics are doing these. Probiotics may help restore microbiota balance. (Liang, 2020)

Vitamins and micronutrients in prevention and treatment support for COVID-19

Defensins and cathelicidins induction explained the Vitamin D role in decreasing viral activity and cytokines activity reduction. For people with risk factors to develop COVID-19, the newest evidence is suggesting a few weeks of 10000 IU/day followed by 5000 IU/day maintenance dose (Grant et al., 2020). Stabilizing a target level of 40-60 ng/ml for 25(OH)D concentration must be the objective (Grant et al., 2020). For healthy subjects, Vitamin C supplementation is not necessary but is recommended for people with a deficit to support the immune response (Hemilä, 2017; van Driel et al., 2019). Zinc deficiency modifies acquired immunity development and is common in modern lifestyle. A protective role in SARS-CoV2 infection will be provided

by 50 mg Zn/ day, enhancing host resistance in viral infection could be recommended, as literature is specifying (Shankar and Prasad, 1998; Read et al., 2019; Science et al., 2012; Saigal and Hanekom, 2020; Awotiwon et al., 2017). Different types of immune responses may be affected by selenium intake showing a potential role of selenium supplementation in viral infections (Guillin et al., 2019; Harthill, 2011; Rayman, 2012; Shojadoost et al., 2019).

Healthy immune responses are generally promoted by phytonutrients in the diet, mainly colourful vegetables. These micro and phytonutrients provide anti-inflammatory nutrients and antioxidants like beta-carotene, vitamin E, vitamin C, polyphenolic compounds which modulates immune functions (Zhang and Liu, 2020; Calder et al., 2020).

Lifestyle medicine approach and mindfulness

Mindfulness refers to a mental state (Hofmann and Gómez, 2017) defined by a nonjudgemental awareness of the present moment, including body sensations, thoughts, emotions, mind. Self-regulation of attention is in synergy with openness, acceptance and curiosity. Maladaptive mindless state in quarantine, as a first reaction mainly to this pandemic crisis, lead to specific unhealthy behaviours. Researchers demonstrated that wondering predicts unhappiness (Killingsworth and Gilbert, 2010). A large study evaluated that 47% of subjects waking time was spent wandering (Killingsworth and Gilbert, 2010) with constant dissatisfaction. In contrast, higher wellbeing state, from a psychological perspective, is associated with keeping the mind focused on the moment (Brown and Ryan, 2003). Mindfulness mechanisms proved therapeutic effects on emotional wellbeing.

Quarantine is a period when mindfulness practices could help in reducing anxiety and depression, and uniquely to filter news, so called "diet information" will help to manage worries (Ashrafi-Rizi and Kazempour, 2020). Like is recommended to select good quality food in the right quantity, is advised to choose a limited number of daily news about COVID-19, filtered from scientific proofed sources, to maintain a good reality perception and not to be overwhelmed by negativity.

Further lifestyle lessons

Higher susceptibility for SARS-CoV 2 infection and risk to develop severe forms of COVID-19 for obese people, even young is pointing out once more that obesity is a real pandemic state and we need to learn the lesson that overweight and obesity should be addressed earlier with stronger efforts (Hâncu and Mihăițan, 2020).

The right nutrition, with optimal energy intake, correct macronutrients and micronutrients intake, daily physical activity, optimal sleep, absence of smoking, alcohol absence or in moderation, all together connected in a healthy psychological state are basic lifestyle medicine principles that will represent learned lessons for the future.

A healthy lifestyle must gain more importance, and many efforts should be spent in preserving health, in building healthy habits that will decrease obesity prevalence, with direct impact on noncommunicable diseases prevalence decrease.

Conclusions :The short and long term consequences of the SARS-COV-2 infection are not fully known yet. However, we can already acknowledge the complex interaction it has with an existing diabetes condition, as well as the risk of driving up the incidence of this pathology.

Here are a few key factors that drive up the negative diabetes evolution for the COVID-19 patients: chronic stress, significant lifestyle changes, limited access to medical assistance for the patients suffering from chronic conditions and simply the direct impact of the virus on top of diabetes

While the coronavirus preventive measures are needed for the entire population, this is especially true for the higher risk (diabetes) patients.

To develop a healthy lifestyle at populational level, to implement it at individual level, day by day, with doctors as main role models, should become future target.

Take home lesson from this dramatic experience with COVID-19 should be for the future to build more on healthiness, prevention and a healthy lifestyle.

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