SCIENCE AND INNOVATION
INTERNATIONAL SCIENTIFIC JOURNAL VOLUME 1 ISSUE 8
UIF-2022: 8.2 | ISSN: 2181-3337

CHRONIC MYELOID LEUKEMIA EPIDEMIOLOGY IN THE FERGANA REGION OVER DECADE: FROM 2010 UNTIL 2020.

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https://doi.org/10.5281/zenodo.7479244

Abstract. *CML is caused by a genetic change (mutation) in the stem cells produced by the bone marrow.The mutation causes the stem cells to produce too many underdeveloped white blood cells. It also leads to a reduction in the number of other blood cells, such as red blood cells. Examine the epidemiology of Chronic Myeloid Leukemia (CML) in the Fergana region, compare it to other populations, and identify factors that influence the disease's causes.*

Keywords: *Chronic myeloid leukemia (CML), hematology, epidemiology, Fergana, Ph-chromosome*

ЭПИДЕМИОЛОГИЯ ХРОНИЧЕСКОГО МИЕЛОИДНОГО ЛЕЙКОЗА В ФЕРГАНСКОЙ ОБЛАСТИ ЗА ДЕСЯТИЛЕТИЕ: С 2010 ПО 2020 ГГ.

Аннотация. *ХМЛ вызывается генетическим изменением (мутацией) стволовых клеток, продуцируемых костным мозгом. Мутация приводит к тому, что стволовые клетки производят слишком много недоразвитых лейкоцитов. Это также приводит к уменьшению количества других клеток крови, таких как эритроциты. Изучить эпидемиологию хронического миелоидного лейкоза (ХМЛ) в Ферганской области, сравнить ее с другими популяциями и выявить факторы, влияющие на причины заболевания.*

Ключевые слова: *Хронический миелоидный лейкоз (ХМЛ), гематология, эпидемиология, Фергана, Ph-хромосома.*

INTRODUCTION

Objective: Examine the epidemiology of Chronic Myeloid Leukemia (CML) in the Fergana region, compare it to other populations, and identify factors that influence the disease's causes. *Methods*: This was a descriptive study for patients who were treated in the hematology department of Fergana Regional Multidisciplinary Medical Center during ten years (from 2010 until 2020) with an evaluation of age, gender distribution, and frequency distribution of chronic myeloid leukemia according to age as well as gender. *Result:* In 2013, there were 150 more patients with CML in this hospital than in other research years. And so, with a male to female ratio of nearly 1,2:1.

In 2022, there are 60,650 new cases of leukemia will be prognosis to diagnosis in the US and 24,000 people will die from the these diseases. Compared to all leukaemias accounted for some 474 519 new cases in the world, until now [(2)]. This situation is decreased years-by-years. Leukemia is a production of abnormal leukocytes either as a primary or secondary process. Based on the rapidity of proliferation, they can be classified as acute or chronic, as well as myeloid or lymphoid based on the originator cell. In recent times, predominant subtypes are acute myeloid leukemia (AML) and chronic myeloid leukemia (CML), involving the myeloid chain; and acute lymphoblastic leukemia (ALL), and chronic lymphocytic leukemia (CLL)

involving the lymphoid chain. Other less common variants such as mature B-cell and T-cell leukemias, NK cell-related leukemias, to name a few, arise from mature WBC cells. (3) Although, chronic myeloid leukemia (CML) accounts for 15% of adult leukemias. Chronic myeloid leukemia is most frequently diagnosed among people aged 65–74. (1 figure). Chronic myeloid leukemia is characterized by unchecked proliferation of myeloid cells at every stage of differentiation (5) CML is the first discovery of a link between cancer and chromosomal anomaly, which is called the Philadelphia (Ph) chromosome. The Philadelphia chromosome, characterized by the reciprocal balanced translocation t(9;22) (q34;q11), is the pathognomonic hallmark of chronic myeloid leukemia (CML). A proportion of individuals with CML show additional non-Philadelphia aberrations (nPhAs) already at diagnosis or as a result of clonal evolution during disease progression. (6).

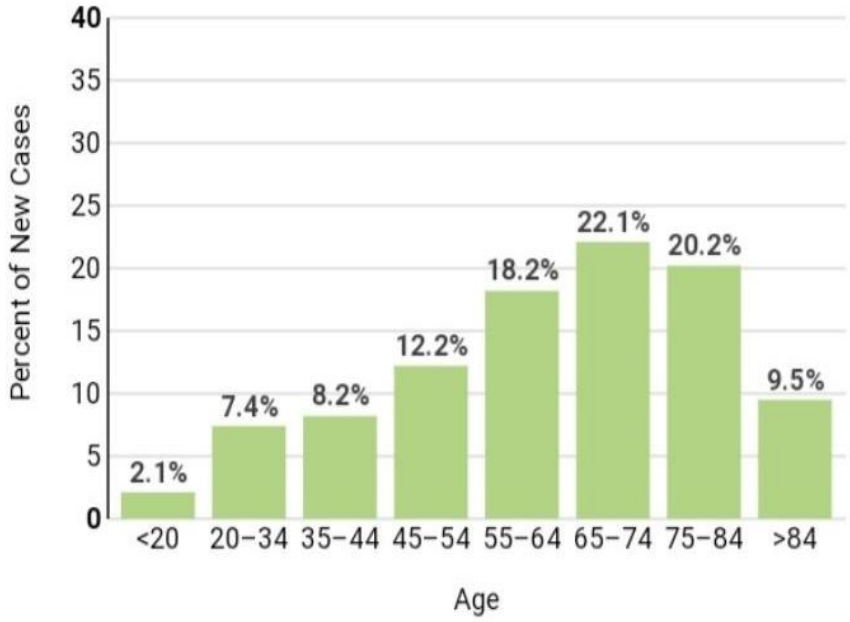

Figure 1. Percent of New Cases by Age Group: Chronic Myeloid Leukemia: SEER 22 2015–2019, All Races, Both Sexes

In this statistical analysis, we determined the prevalence of chronic myeloid leukemia in the Fergana area of Uzbekistan from 2010 to 2020. It can assist in supplying fundamental knowledge to explore the epidemiological traits of this disease, to evaluate recent advancements, and to create future chronic myeloid leukemia therapy plans.

MATERIALS AND METHODS

In the Fergana region, we conducted a retrospective, inferential, and epidemiological study of chronic myeloid leukemia patients treated from 2010 until 2020. We identified statistical data was first report for the Hematology department of Fergana Regional Multidisciplinary Medical Center in Fergana. Because, there were not statistical report of chronic myeloid leukemia data before. Data provided information about evaluation of age, gender distribution, and frequency chronic myeloid leukemia. The patients with chronic myeloid leukemia were diagnosed at the Republic of Uzbekistan Center of Specialized Hematology, Scientific and Applied Medicine before being treated in Fergana. There, all diagnoses were made

on peripheral blood films and morphology of bone marrow including cytochemical staining and immunophenotyping.

Statistical analysis: We could use Inferential Statistical Analysis for the information obtained in epidemiology of Chronic Myeloid Leukemia. Because, this way helps that by this way, it is highly preferable while drawing conclusions and making decisions about the whole population on the basis of sample data. As such, this method involves the sampling theory, various tests of significance, statistical control etc.(7) Inferential statistics presented as count (frequency), proportions, median and interquartile range (IQR), findings presented in tables and figure using MS-office software version 2016.

RESULTS

We retrospectively analyzed the patients with chronic myeloid leukemia who were treated in the hematology department of Fergana Regional Multidisciplinary Medical Center during our study. As a result, we identified that there were primary diagnoses made and treated in this hospital for 157 patients in 2013. During our study, this figure was critical to a critical degree in all years. Vice versa, in 2019, 85 patients were treated.(Figure 2)

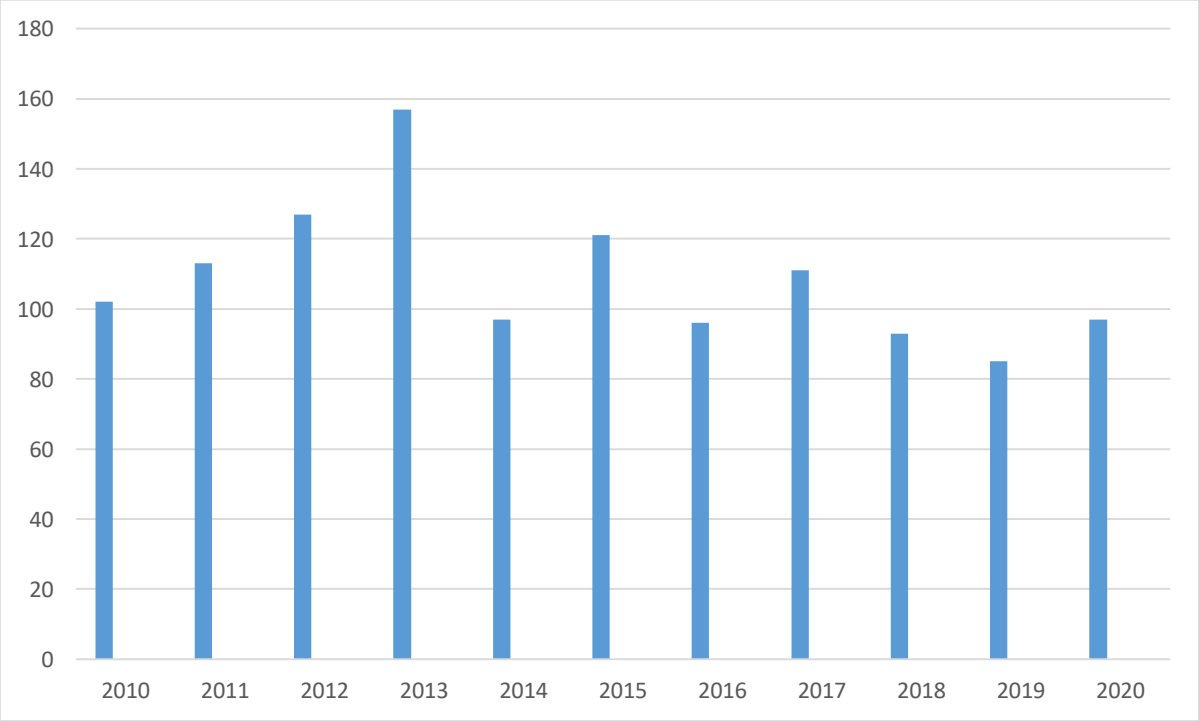

Figure 2. The number of patients were treated in the hematology department of Fergana Regional Multidisciplinary Medical Center.

A total of 1199 patients are treated as inpatients in the hematology department of Fergana Regional Multidisciplinary Medical Center, the percentage distribution of study population showed that 591(49.29%) females and 608(50.71%) males are affected, which are represented in figure:

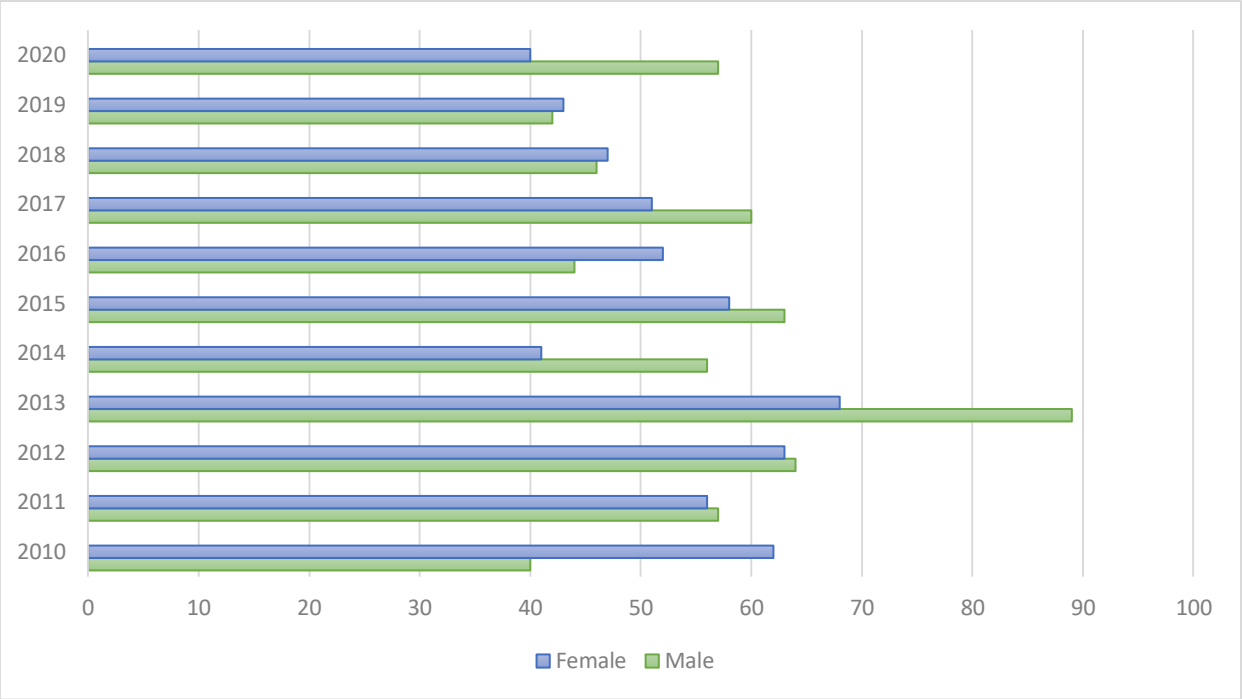

Figure 3. Gender Distribution of patients of Chronic myeloid leukemia Reported During the Period 2010 – 2020.

Total distribution of patients with age group shows that majority of patients were found in the age group of 45-54 (30%), 55-64 (26%), 35-44 (21%), 20-34 (15%) , 65-74 (5%), >20 (4%), 75< (1%) were represented in table and pie chart:

	010	011	012	013	014	015	016	017	018	019	020
20											
0-34			7	8		8	9	4	2	1	8
5-44	4	7	0	4	2	8	3	7	2	8	4
5-54	4	0	1	9	8	3	5	8	7	5	4
5-64	6	9	9	1	6	2	3	6	7	4	7
5-74					8						
5<											

Table 1. Age distribution of CML patients

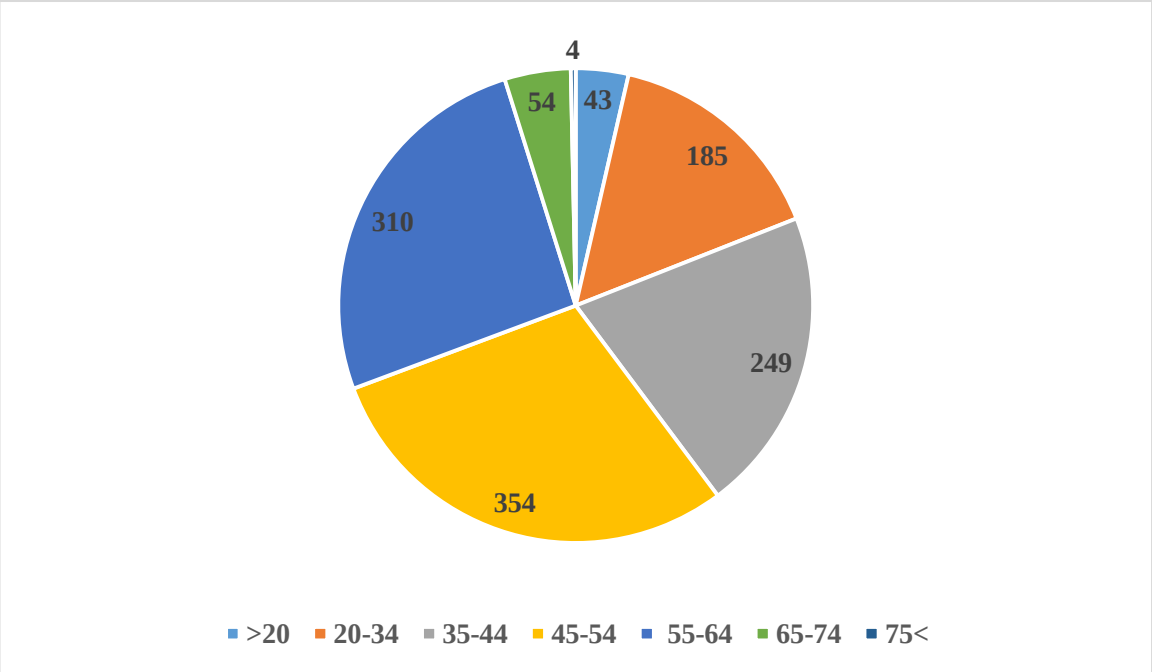

Figure 4. Age distribution of CML patients

Disussion: The quality and ability to access to the health systems can explain the geographical differences in all types of leukemia, in addition Chronic myeloid leukemia, although etiological factors including gene-environment interactions would probably play a important role.(8) Chronic myeloid leukemia rates in males were generally higher than females with a total M/F of 1.2:1, which was the same as in our study.

The median age of CML in Fergana region was 45-54 ages group, which is older than previous study done in the world with median age of ~ 65 years. Our result was closer to median age in Turkey 46 years and Bangladesh was 40 years old. Interestingly much younger than of US with median age of 65 years and Europe 55 years old [9-10-11].

In conclusion distribution of Chronic myeloid leukemia in Fergana region differs from other regions, with median age which is 45-54 ages group than western countries. More studies are needed to understand the Chronic myeloid leukemia patterns and dissemination in Fergana and recognize biology, genetics & possible risk factor in uzbek patients.

Acknowledgements: We would like to thank the hematology department of Fergana Regional Multidisciplinary Medical Center, without their help this study could not see the light of day.

CONCLUSION

This is the first statistical study of chronic myeloid leukemia in Fergana. It can be used as basic information to investigate epidemiological characteristics, to evaluate progress in recent years and to develop future CML strategies. More statistical CML analyses in Uzbekistan are needed.

REFERENCES

1. Cancer Facts & Figures is an annual publication of the American Cancer Society, Atlanta, Georgia cancer.org | 1.800.227.2345 80-(16)
2. https://gco.iarc.fr/today/about#references // Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer

Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [DD Month YYYY].

3. Adithya Chennamadhavuni[1], Varun Lyengar[2], Alex Shimanovsky[2] : Leukemia. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan. 2022 May 4. Affiliations expand PMID: **32809325** Bookshelf ID: NBK560490
4. M. Deininger, N. Shah, +26 authors Hema M Sundar: Chronic Myeloid Leukemia, Version 2.2021, NCCN Clinical Practice Guidelines in Oncology. Medicine Journal of the National Comprehensive Cancer Network Volume 18 Issue 10 | October 2020 1386-1415.
5. Arber D, Orazi A. The updated WHO classification of hematological malignancies: the 2016 revision to the WHO classification of myeloid neoplasms and acute leukemia. Blood J. 2016;127:2391–2405. [PubMed] [Google Scholar]
6. Axel Karow 1,2,* , Gudrun Göhring 3 , Stephanie Sembill 1,2, Friederike Lutterloh 3 , Fina Neuhaus 3 , Sara Callies 3 , Elke Schirmer 1,2, Zofia Wotschofsky 1,2, Oisin Roche-Lancaster 2,4, Meinolf Suttorp 5 , Manuela Krumbholz 1,2 and Markus Metzler 1,2 1: The Cytogenetic Landscape of Pediatric Chronic Myeloid Leukemia Diagnosed in Chronic Phase *Cancers* 2022, *14*(7), 1712; https://doi.org/10.3390/cancers14071712
7. https://www.analyticssteps.com/blogs/7-types-statistical-analysis-definition-explanation
8. Ahmed Mjali1, Haider Hasan Jaleel Al-Shammari2 Zahraa Deheyaa Azeez4, Saja Khudhair Abbas. Leukemia Epidemiology in Karbala province of Iraq. Asian Pac J Cancer Care, 4 (4), 135-139 Submission Date: 04/08/2019 Acceptance Date: 07/12/2019
9. Hossain MS, Iqbal MS, Khan MA, Rabbani MG, Khatun H, Munira S, Miah MM, Kabir AL, Islam N, Dipta TF, Rahman F. Diagnosed hematological malignancies in Bangladesh-a retrospective analysis of over 5000 cases from 10 specialized hospitals. BMC cancer. 2014 Dec; 14(1):438
10. AlameriA,Khudhair M ,BatoolG,Murad N. Epidemiology of chronic myeloid leukemia in Iraqi patients.14th Congress of the European Hematology Association Abstract Book haematologica 2009; 94(s2), p 578.
11. Alwan AF. Assessment of cytogenetic response after treatment with imatinibmesylate in patients with chronic phase chronic myeloid leukemia. Iraqi J Hematology. 2014;3(1): 56-61.