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LOOKING FROM THE STARS: THE ZODIAC SIGN IN COVID-19 PATIENTS

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Abstract

Aim: The time of birth is a factor that affects the health of the individual. In this study, we aimed to determine whether the birth time and zodiac sign distribution of coronavirus disease-2019 (COVID-19) patients, an immune response-related viral disease that negatively affects life in the world, was different from the general population.

Material and Methods: Three thousand one hundred six patients aged 18 years and older who were treated for COVID-19 infection were retrospectively included in the study. Birth dates and demographic and clinical data of patients were recorded.

Results: Nine hundred sixteen (29.5%) patients were born in spring, 635 (19.2%) in summer, 501 (14.8%) in autumn, and 1,135 (36.5%) in winter. Although births in Turkey were statistically more frequent in the summer and autumn seasons, the proportion of people born in spring and winter was higher in COVID-19 patients. The least common zodiac sign in COVID-19 patients was Scorpio (4.4%), whereas the least common zodiac sign in the general population was Sagittarius (5.4%). Compared with the zodiac map of Turkey, the frequency of Capricorn, Aries, Aquarius, and Pisces was higher in COVID-19 patients. It was noteworthy that the mortality rate in COVID-19 patients was highest in the sagittarius (7.1%) and at least in the libitum (1.8%).

Conclusion: The most common zodiac sign in COVID-19 patients was Capricorn, and the least common horoscope was Scorpio. The mortality rate of COVID-19 patients with Scorpio, Virgo, Sagittarius, Aquarius, and Capricorn signs was found to be higher than the others.

Keywords: COVID-19, immunity, zodiac sign

INTRODUCTION

In a healthy person, the immune system is in balance. The disruption of this balance in the immune system facilitates the occurrence of diseases in different spectrum (1-3). Although the factors that cause immune system disruption are still not fully known, many factors can be effective in etiopathogenesis. Many environmental factors, such as low vitamin D levels, ultraviolet radiation, infections, and melatonin levels, can cause the imbalance of the immune system (4-8). All of these factors can be effective at different seasonal levels. For example, the frequency of infection may increase because of a decrease in vitamin D levels in winter (9).

In the science of astrology, which has kept its mystery for centuries, especially the time of birth (detailed date, day, time, etc.) has become a particular focus of attention. In recent years, medical astrology has increased in popularity by attracting more and more people's attention. Within the Zodiac is the area of the sky where the sun, moon, planets, and stars are located. the

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various characteristics of the signs have emerged as a result of the celestial bodies in the zodiac at the time of birth and the position of these bodies. However, there are limited data on the health effects of zodiac signs. Although our lifestyle, healthy living, and eating habits affect our health, zodiac signs are also claimed to be associated with some diseases (10,11). For example, it is claimed that the most anxious signs of the disease are crab and pisces, the fastest healing sign is scorpio, and the most durable sign is capricorn.

Coronavirus disease-2019 (COVID-19) is still a serious viral disease that results in ongoing mortality and morbidity. In COVID-19 infection, sometimes an asymptomatic or very severe clinical course can be observed in the person's immune system (12,13). Numerous studies have been conducted on risk factors such as gender, age, and chronic diseases that can affect the clinical course of COVID-19, which currently has no effective treatment (14). In addition, the association of COVID-19 infection with autoimmune response is known (13). Considering the possible relationship between seasonal factors and immune response, the effect of seasonality and medical astrology in COVID-19 patients was investigated. For this purpose, in our study, birth seasons and horoscope distribution were investigated in COVID-19 patients who had recovered and died.

MATERIAL AND METHODS

Three thousand one hundred six patients aged 18 years and older diagnosed with COVID-19 at University of Health Sciences Turkey, Elazığ Fethi Sekin City Hospital between April 2020 and April 2021 were included in the study. The age, gender, date of birth, and discharge status were retrospectively scanned from the files of patients hospitalized and treated according to the COVID-19 Diagnosis and Treatment Protocol published by the Turkish Ministry of Health. Patients with a history of Alzheimer's disease, malignancy, and immunological and inflammatory rheumatic diseases were not included in the study. The diagnosis of COVID-19 pneumonia was confirmed by reverse-transcription polymerase chain reaction and computed tomography scans that detected severe acute respiratory syndrome-coronavirus 2 nucleic acid in the nasopharyngeal swab. The dates of birth of the patients were categorized as Capricorn, Aquarius, Pisces, Aries, Taurus, Gemini, Crab, Leo, Virgo, Libra, Scorpio, and Sagittarius, which are known as 12 zodiac signs (15). This study was approved by Fırat University Non-invasive Research Ethics Committee (date: 12.04.2021, approval no: 2021/1757).

Statistical Analysis

The continuous data obtained in the study are presented as mean ± standard deviation. Statistical analyses were conducted using the International Business Machines-Statistical Product and Service Solutions (IBM-SPSS, version 22.0) software (IBM Corp., Armonk, NY, USA). The demographic and clinical characteristics of the groups were determined. The compliance of the data with normal distribution was analyzed using the Kolmogorov-Smirnov test. Analysis of continuous variables with normal distribution was performed using Student's t-test, and analysis of continuous variables not showing normal distribution was performed using Mann-Whitney U test. The continuous data obtained in the study are presented as mean ± standard deviation. The chi-square test was used for categorical data. For dual comparison, the Student's t-test was performed p values <0.05 were considered significant.

RESULTS

Of the 3,106 patients who participated in the study, 1,756 (56.5%) were women and 1,350 (43.5%) were men. The average age of the patients who recovered was 63.2±17.1 [(minimum (min): 18, maximum (max): 100], and the average age of the patients who died was 73.7±11.8 (min: 19, max: 101). The number of patients who recovered was 2,939 (94.6%) and the number of patients who died was 167 (5.4%). Of the patients who died, 104 (62%) were male and 63 (38%) were female. Patients were divided into four groups: spring, summer, autumn, and winter, according to the season in which they were born. Accordingly, 916 (29.5%) patients were born in spring, 635 (19.2%) in summer, 501 (14.8%) in autumn, and 1135 (36.5%) in winter. According to 2010-2019 Turkey birth statistics, 23.8% of births in Turkey occurred in spring, 25% in summer, 27.4% in autumn, and 23.8% in winter, and the seasons where births were most frequent were summer and autumn with a rate of 52.4%. In contrast to these data, 66% of COVID-19 patients were born in spring and winter.

The demographic characteristics of COVID-19 patients in our study according to zodiac sign distribution are presented in Table 1. In our study, Scorpio (4.4%) was the least common zodiac sign in COVID-19 patients, whereas Capricorn was the most common sign (19.3%). The zodiac sign map of Turkey according to population data is given in Table 2 (16). According to this table, the most common zodiac sign in Turkey was Capricorn (13.1%), and the least common sign was Sagittarius (5.4%). Compared with the horoscope map of Turkey, the frequency of Scorpio, Leo, and Virgo horoscopes was lower in COVID-19 patients, whereas the frequency of Capricorn, Aries, Aquarius, and Pisces horoscopes was greater (Figure 1). The mortality rate in COVID-19 patients was 7.1% in Sagittarius, 7% in Capricorn, 2.4% in Taurus, and 1.8% in Libra (Table 1, Figure 2). There were no statistical differences between Libra and Sagittarius in terms of average age and gender (p=0.997 for average age, p=0.132 for gender).

Table 1. The Demographic characteristics of COVID-19 patients by zodiac sign

Zodiac sign	Incidence (%)	Age (years*)	Gender (F/M), n (%)	Mortality, n (%)
Scorpio	136 (4.4)	66.6±14.2	48/88 (35.2/64.8)	9 (6.2)
Leo	148 (4.8)	65.4±14.4	48/100 (32.4/67.6)	5 (3.3)
Virgo	160 (5.2)	67.2±14.2	57/103 (35.6/64.6)	11 (6.5)
Libra	164 (5.3)	66.2±16.1	70/94 (42.6/57.4)	3 (1.8)
Sagittarius	183 (5.8)	65.8±14.9	80/103 (43.7/56.3)	13 (7.1)
Gemini	184 (5.9)	65.4±16.8	68/116 (36.9/63.1)	6 (3.2)
Taurus	228 (7.3)	64.9±16.2	109/119 (47.8/52.2)	6 (2.6)
Crab	266 (8.6)	66.3±15.2	111/155 (43.6/56.4)	14 (5.2)
Aries	325 (10.4)	65.7±15.3	133/192 (40.9/59.1)	19 (4.6)
Aquarius	327 (10.5)	65.7±15.1	143/184 (43.7/56.3)	19 (5.7)
Pisces	388 (12.5)	66.9±14.3	135/253 (34.8/65.2)	20 (5.1)
Capricorn	598 (19.3)	65.6±15.4	245/353 (40.9/59.1)	42 (7)

*The data have been given as mean ± standard deviation

Table 2. The zodiac sign distribution of Turkey according to population

Capricorn n (%)	10,641,392 (13.1)
Crab n (%)	8,564,783 (10.5)
Pisces n (%)	7,770,373 (9.6)
Aquarius n (%)	6,999,345 (8.6)
Taurus n (%)	6,836,049 (8.45)
Aries n (%)	6,804,041 (8.41)
Gemini n (%)	6,146,499 (7.6)
Virgo n (%)	6,128,562 (7.5)
Libra n (%)	5,802,047 (7.1)
Leo n (%)	5,704,819 (7)
Scorpio n (%)	5,014,785 (6.2)
Sagittarius n (%)	4,406,373 (5.4)

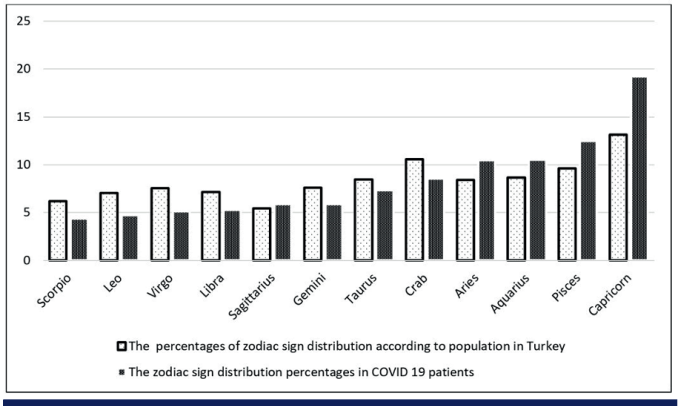

Figure 1. Zodiac sign distribution (%) in the general population and COVID-19 patients
COVID-19: Coronavirus disease-2019

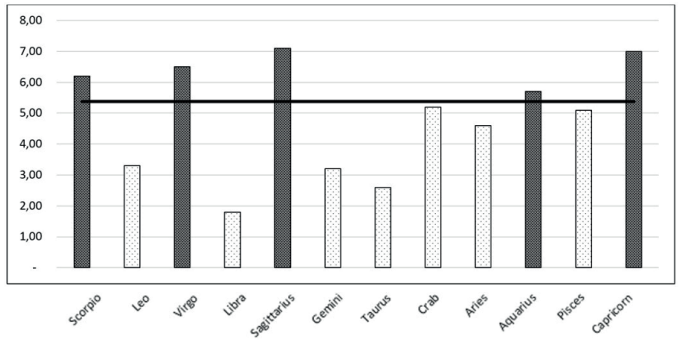

Figure 2. Mortality rates (%) by zodiac sign in COVID-19 patients. In our study, the mortality rate in COVID-19 patients was 5.38%. The mortality rate was above the average in COVID-19 patients with Scorpio, Virgo, Sagittarius, Aquarius, and Capricorn signs
COVID-19: Coronavirus disease-2019

DISCUSSION

The global healthcare system is still severely affected by the COVID-19 epidemic. By April 18, 2021, close to 140 million people worldwide had been infected with COVID-19 and approximately 3 million people had died. Immune-mediated damage seen in the disease adversely affects morbidity and motality (17). The increasing number of cases and deaths due to the epidemic triggers anxiety and stress in humans. In this respect, studies on COVID-19 have attracted considerable attention. Scientists have focused on studies on the diagnosis, prognosis, and treatment of COVID-19. Factors such as male gender, advanced age, comorbid diseases such as diabetes and hypertension, high C-reactive protein, D-dimer, and lymphopenia are known to negatively affect the prognosis of COVID-19 (18). However, most of these

factors are the result of the disease. It is much more important to determine why these factors occur in some patients. Only in this way can effective treatments be developed by determining pathogenetic pathways.

The immune system can be affected in different ways depending on the season. For example, because melatonin levels may decrease in spring, those born during this season may have a higher risk of multiple sclerosis (MS). In those born in summer, the risk of MS disease due to vitamin D height may decrease. However, infectious agents may vary by season. For example, in summer, the risk of *E. coli* infection can increase, which can trigger the risk of primary biliary cirrhosis. In winter, the risk of rotavirus infection may increase, which can trigger type 1 diabetes. As a result, seasonal hormones and infectious factors can facilitate or prevent the formation of certain diseases by affecting immunity even in the womb (19,20). The severity of the immune response in COVID-19 infection may vary.

If the immune system responds excessively, various immune-related diseases, such as vasculitis and macrophage activation syndrome, can be triggered (13). Considering all this information, we conclude that hormonal and immunological factors from the embryological period can be affected by the season cycle. Therefore, whether the prognosis of COVID-19 is related to the time of birth of the individual is a question that needs to be answered. In our study, patients diagnosed with COVID-19 were mostly born in spring and winter. This can be associated with lower vitamin D levels in winter and lower melatonin levels in spring. Studies have shown that more positive results are obtained with supplementation of vitamin D and melatonin for treating COVID-19 (21,22).

Another classification method related to the time of birth of an individual is the zodiac sign. Although it is said that the history of astrology is based on the Assyrian and Babylonian civilizations, it is not known exactly when it emerged. the various characteristics of the signs are related to the position of the celestial bodies in the zodiac at the time of birth. According to medical astrology, signs can be associated with certain diseases (10,11). The number of scientific studies on the relationship between zodiac signs and diseases is limited. In a study, it was shown that there was a relationship between signs and the degree of malocclusion (23). Another study investigated whether the leo sign was a risk factor for heart disease, but no such relationship was found (24). In a different study, it was concluded that the result that survival after stem cell transplantation in patients with chronic myeloid leukemia is related to signs is erroneous (25).

CONCLUSION

In our study, the most common zodiac sign in COVID-19 patients was Capricorn, and the least common horoscope was Scorpio. It was a remarkable finding that the lowest mortality rate in COVID-19 patients compared with the overall mortality rate was found in Libra and the highest mortality rate in Sagittarius. The number of babies born in autumn and summer was less than that born in spring and winter. While the least common sign in patients was scorpio, the least common sign in those who died was libra. These results suggest that the immune system response in COVID-19 disease may change with the season. A broader, multicenter, and randomized study can be conducted to explain this relationship in more detail, and a broader perspective can be provided for COVID-19. The fact that the study was conducted retrospectively and single-center is seen as a limitation in terms of the results.

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Ethics

Ethics Committee Approval: This study was approved by Fırat University Non-invasive Research Ethics Committee (date: 12.04.2021, approval no: 2021/1757).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: A.K., M.T., Concept: A.K., M.T., Design: A.K., Data Collection or Processing: M.T., Analysis or Interpretation: A.K., Literature Search: A.K., Writing: A.K.,

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REFERENCES

1. Zhu L, Hua F, Ding W, Ding K, Zhang Y, Xu C. The correlation between the Th17/Treg cell balance and bone health. Immun Ageing 2020;17:30.
2. Zou J, Liu C, Jiang S, Qian D, Duan J. Cross Talk between Gut Microbiota and Intestinal Mucosal Immunity in the Development of Ulcerative Colitis. Infect Immun 2021;89:e0001421.
3. Rossi JF, Lu ZY, Massart C, Levon K. Dynamic Immune/Inflammation Precision Medicine: The Good and the Bad Inflammation in Infection and Cancer. Front Immunol 2021;12:595722.

4. Zheng D, Liwinski T, Elinav E. Interaction between microbiota and immunity in health and disease. Cell Res 2020;30:492-506.

5. Zhao CN, Wang P, Mao YM, et al. Potential role of melatonin in autoimmune diseases. Cytokine Growth Factor Rev 2019;48:1-10.

6. Zhao R, Zhang W, Ma C, et al. Immunomodulatory Function of Vitamin D and Its Role in Autoimmune Thyroid Disease. Front Immunol 2021;12:574967.

7. Zhou SY, Zhang C, Shu WJ, et al. Emerging Roles of Coronavirus in Autoimmune Diseases. Arch Med Res 2021;52:665-72.

8. Bernard JJ, Gallo RL, Krutmann J. Photoimmunology: how ultraviolet radiation affects the immune system. Nat Rev Immunol 2019;19:688-701.

9. Derbyshire EJ, Calder PC. Respiratory Tract Infections and Antibiotic Resistance: A Protective Role for Vitamin D? Front Nutr 2021;8:652469.

10. Greenbaum DG. Astronomy, Astrology, and Medicine. In: Ruggles Clive LN, editor. Handbook of Archaeoastronomy and Ethnoastronomy. New York : Springer 2015;117-32.

11. Iwaniszewski S. Concepts of Space, Time, and the Cosmos. In: Ruggles Clive LN, editor. Handbook of Archaeoastronomy and Ethnoastronomy. New York: Springer 2015;p.3-14.

12. Carsetti R, Quinti I, Locatelli F. COVID-19 - pathogenesis and immunological findings across the clinical manifestation spectrum. Curr Opin Pulm Med 2021;27:193-8.

13. Jamal M, Bangash HI, Habiba M, et al. Immune dysregulation and system pathology in COVID-19. Virulence 2021;12:918-36.

14. Abdelrahman Z, Liu Q, Jiang S, et al. Evaluation of the Current Therapeutic Approaches for COVID-19: A Systematic Review and a Meta-analysis. Front Pharmacol 2021;12:607408.

15. American Federation of Astrologers, History of Astrology. Rural Rd./ Tempe. https://www.astrologers.com/about/history/, accessed on Sep 3, 2021.

16. Türk halkının burçları – Hürriyet, İstanbul, Turkey. https://www.hurriyet.com.tr/turk-halkinin-burclari-20319633, accessed on Aug 4, 2021.

17. Xu X, Han M, Li T, et al. Effective treatment of severe COVID-19 patients with tocilizumab. Proc Natl Acad Sci U S A 2020;117:10970-10975.

18. Raza HA, Sen P, Bhatti OA, Gupta L. Sex hormones, autoimmunity and gender disparity in COVID-19. Rheumatol Int 2021;41:1375-86.

19. Watad A, Azrielant S, Bragazzi NL, et al. Seasonality and autoimmune diseases: The contribution of the four seasons to the mosaic of autoimmunity. J Autoimmun 2017;82:13-30.

20. Ogura T, Kameda H. [Autoimmune diseases and seasonal variations]. Nihon Rinsho Meneki Gakkai Kaishi 2014;37:25-32.

21. Paiz N, Alonso P, Portillo AL. Vitamin D Status: Can It Affect the Risk of Infection and the Severity of COVID-19 Symptoms? Curr Trop Med Rep 2021;8:204-11.

22. Subedi L, Tchen S, Gaire BP, Hu B, Hu K. Adjunctive Nutraceutical Therapies for COVID-19. Int J Mol Sci 2021;22:1963.

23. Vingnesh R, Padmapriya VM. Malocclusion and zodiac signs: A correlative study. Drug Invention Today 2019;11:1296-8.

24. Gurm HS. "Predicting incidence of some critical events by sun sign-the Pisces study." Acc Current Journal Review 2003;12:22-4.

25. Szydlo RM, Gabriel I, Olavarria E, Apperley J. Sign of the Zodiac as a predictor of survival for recipients of an allogeneic stem cell transplant for chronic myeloid leukaemia (CML): an artificial association. Transplant Proc 2010;42:3312-5.