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Association of COVID -19 severity with gender and life style in Babylon province

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Abstract

This study was aimed to survey about COVID-19 infection severity, attachment with gender, urban and rural, age and vaccination, it was concluded 250 data persons that have past COVID infection during period 2019-2021, from different places in Babylon province to detect blood group, age (range 18-90), life style (urban and rural), and vaccinated, results revealed a significant difference ($p \leq 0.0357$) between the sever and non-sever for both urban and rural locations ($p \leq 0.0046$), the difference is not significant ($p > 0.0001$). There were 18 (23.7%) severe cases and 34 (44.8%) blood group O cases. There were 16 (21.1%) non-severe instances, 19 (25%), severe cases (10 and 13.2%), non-severe cases (9 and 21.8%), and blood group B (16 and 21%). AB blood group 7 (9.3%), severe cases 4 (5.3%), non-severe cases 3 (4%), severe cases 6 (7.9%), and non-severe cases 10 (13.1%). The study was concluded highlight the multifaceted association between demographiic features, vaccination rank, inherited tendencies, and hormone levels, underlining the varied countryside of COVID-19 harshness. Knowing these links is essential for framing attentive intercessions and relaxing tactics to lessen the impression of the sickness.

Keywords: COVID-19; Urban; Rural; Life style and ABO

1. Introduction

Seven coronaviruses are known to infect people, making them part of a wide family of viruses that affect both humans and animals. While some strains, including MERS, can cause serious sickness, four common strains (229E, NL63, OC43, and HKU1) usually cause moderate respiratory diseases (WHO, 2020). After first appearing in Wuhhan, China, in last month of 2019, COVID-19—originally known as 2019-nCoV—was subsequently deemed a pandemic (1). The incubation period of virus is 2–14 day and is mainly disseminated by respiratory droplets. Fever, coughing, and dyspnea are typical symptoms, and complications including pneumonia and acute respiratory distress syndrome can occur. rRT-PCR testing is used for diagnosis, while self-isolation, social distancing, and hand cleanliness are preventative strategies. There is now no specific antiviral medication or vaccine available, and supportive care is the main focus of management (2).

Around 3.4% of COVID-19 cases worldwide have been fatal, Although it fluctuates depending on characteristics including overall health, age, sex, and the quality of the healthcare system, UK Health Secretary Matt Hancock said that the best estimate for the death rate was approximately 2% or lower. The mortality rate was ten times greater among the elderly than in middle-aged people, according to a review of more than 44,000 cases from China. With eight deaths in 4,500 cases, the mortality rates were lowest among those under 30. Additionally, people with underlying illnesses such diabetes, hypertension, and respiratory or cardiovascular diseases had a five-fold higher mortality rate. An increased death rate was observed in men compared to women (3).

Due to the dearth of efficient treatment methods and vaccinations, SARS-CoV-2 poses a serious public health concern. Research indicates that immunological dysregulation in COVID-19 patients results in viral hyper inflammation (4). Wuhan studies revealed a decrease in monocytes, eosinophils, and basophils, a rise in neutrophil counts and neutrophil-

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to-lymphocyte ratio (NLR), and an increase in inflammatory cytokines including interleukin (IL)-6 and tumor necrosis factor (TNF)-α (Lagunas-Rangel, 2020). According to a different study, ICU patients had noticeably higher neutrophil counts than non-ICU patients, and these levels were correlated with both disease severity and death (5).

MERS-CoV uses dipeptidyl peptidase 4 (DPP4) as a cellular entrance receptor, while SARS-CoV-1 and SARS-CoV-2 mainly use the angiotensin-converting enzyme II (ACE2) (6). Tissue damage is facilitated by ACE2, which is expressed in the gastrointestinal and pulmonary tissues (7). Pathogen-recognition receptors (PRRs), including C-type lectin receptors, NOD-like receptors (NLRs), RIG-I-like receptors (RLRs), and Toll-like receptors (TLRs), are activated by viral infection (8). These receptors trigger the expression of pro-inflammatory cytokines by activating interferon regulatory factor 3 (IRF3) and nuclear factor kappa-light-chain-enhancer of activated B cells (NF-κB) (9).

The initial line of defense against viruses is type I interferons (IFNs), which activate the signal transducer and activator of transcription (STAT) and janus kinase (JAK) signaling pathways (10). The severity of COVID-19 disease has been linked to elevated levels of inflammatory cytokines, such as IL-2, IL-7, IFN-γ, TNF-α, macrophage inflammatory protein-1α (MIP-1α), and monocyte chemoattractant protein-1 (MCP-1). Lung pathology and multi-organ failure are caused by the "cytokine storm," or excessive cytokine release (11).

2. Material and methods

2.1. Data Collection: A Questionnaire

Questionnaire taken from the patient and case sheets included age, sex, occupation, signs and symptoms, laboratory test, life style, if there vaccinated or not and history family from 250 persons that have past COVID infection during period 2019-2021, from different places in Babylon province to detect blood group, age (range 18-90), life style (urban and rural), and vaccinated if or not.

2.2. Blood sample for ABO detection

Sample collection avoid hemolysed sample. Sample should store at 2-8 0C. Normal saline: 0.9 %, test tube method It include 2 parts: (1) Forward grouping which mean checking the antigens on RBC membrane. (2) Reverse grouping which mean checking the antibodies in the serum.

2.3. Statistical Analysis

The recognized arithmetical organization, numerical package for common science (SPSS) (the version 22.0) was espoused to suppose the implication, nasty and standard error (S.E.), analysis of Variance (ANOVA), chai square test to determine significant differences among sub-groups and independent sample T test was castoff to compare between means among dissimilar main groups in this study (12).

Figure 1 Blood groups kit

3. Results and Discussion

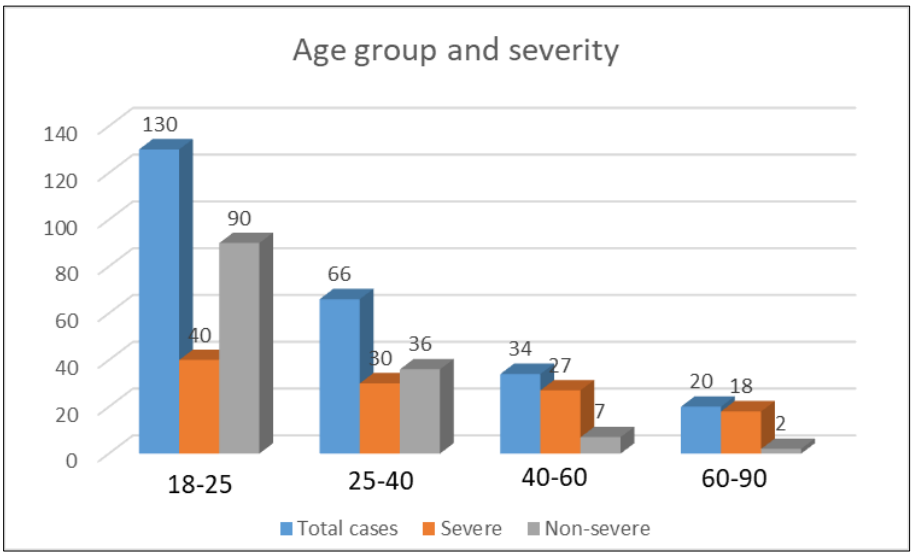

Figure 2 Distribution of age group and number of COVID-19 cases

This study is the first to look at the joining among age collection and the sternness of COVID-19 disease. It is uncertain that the experimental age move was instigated wholly by disparities in difficult handiness, even if hard obtainability has altered by site, period, and test wage-earner.

Rendering to this study, the age pool of eighteen to twenty five years old was the most impacted by the corona virus when compared to either younger or older groups. Despite this, investigation designates that older grownups are more probable than newer persons to bond COVID-19 (13). Also, kids' organizations have advanced protection that might help them contest infection more successfully than elder adults since of their occupied immunization calendar and everyday exposure to breathing diseases (14).

Moreover, the lung system's essential pathophysiologiical vagaries may be in charge for the worst aging outcomes, as may the bigger incidence of continuing comorbidities with aging (15), aged or older patients (age ≥50 years) are at difficult risk of evolving sternness. Children and adolescents have been hospitalized, admitted to intensive care units, and even died as a result of SARS-CoV-2 infection (16).

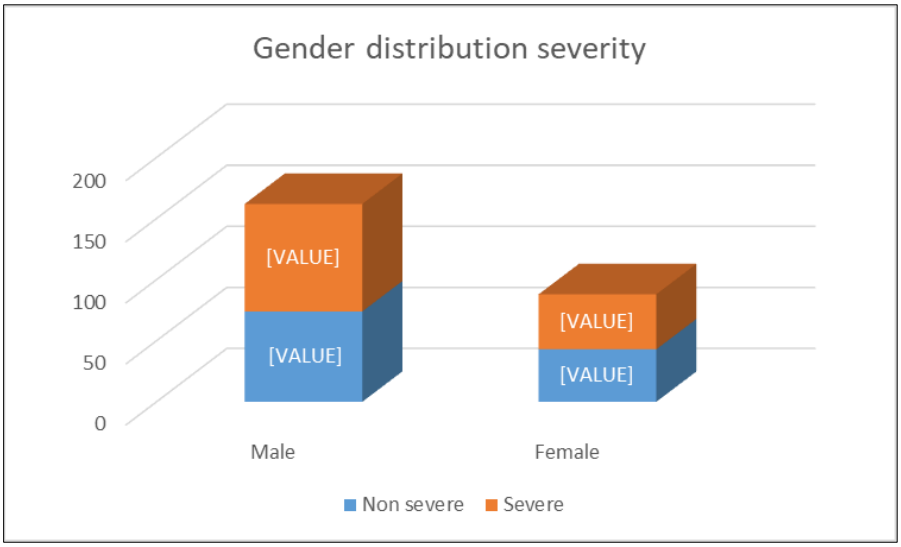

Figure 3 Sex dissemination in harshness of COVID-19 cases

Our results suggest that epidemiiologic differences by masculinity power be unfair by gender inequity. It's uncertain, nonetheless, if this shows real disproportions in the risks of astringent COVID-19 for males and womenfolk or only dissimilarities in who is success or looking for taxing. Conferring to this examination, kinsmen are more disposed to coronaviirus than womenfolk. New check also exposed that womanhood is less forthcoming than men to convert the municipal. For amount, 95.4% of manlike patiients were not dynamic, though only 89.3% of feminine patiients were not. Sexual category and sex-related influences have been practical to have a substantial bearing thriough the constant plague. prominent inequalities sandwiched between the sexual characteristics, with blokes at superior risk than women folk (16). This strength be correlated to the presence of added risk influences and sex horrmones similar esttrogen and testtosterone, which appear to be cruicial in modelling the group's immunological comeback, for occasion, kinsmen are other in the offing than manhood to grieve from diiabetes, high blood gravity, and cardiiovascular disease.

Table 1 COVID-19 case distribution by geography

COVID-19 cases	Rural life style	Urban life style	Chai square	P value
n=250	100 (25%)	150 (75%)	0.447	0.4463
Severe (n=125)	88 (68%)	37 (32%)	4.427	0.0352*
Non severe (n=125)	33 (23%)	92 (77%)	8.041	0.00013*

The association between disease severity and geography. For all patients, the alteration amongst rural and urban settings is not statistiically significant (p≤0.0001). However, it revealed a significant difference (p≤0.0357) between the sever and non-sever for both urban and rural locations (p≤0.0046). The findings demonstrated that living in the country lowers the risk of infection because, according to a study that examined people's lifestyles, peasants in both rural and urban areas lead varied lives. Compared to people who reside in cities or other urban areas, villagers really engage in more activities. While 10% and 7% of the people in the city and town were active, only 18% of the peasants were (Mosab et al., 2021). These studies verified that exposure to COVID-19 infection is correlated with the patient's occupation. As a result, work has been seen as a major factor in determining the risk of infection (17).

Table 2 Relationship between vaccination and severity of COVID-19 cases

COVID-19 cases	vaccinated	Non vaccinated	Chai square	P value
n=250	106 (25%)	144 (75%)	0.447	0.4463
Severe (n=125)	40 (23%)	85 (77%)	8.527	0.0455*
Non severe (n=125)	90 (68%)	35 (32%)	4.0479	0.023*

The association between vaccine and disease severity was displayed in Table (2). The difference between non-sever and severe is not statiistically signiificant (p>0.0001). There were notable differences between the vaccinated and non-vaccinated non-severe groups as fit as stuck between the vacinated and non-vacinated sever groupg.

Disease attenuation, which is defined as whether or not individuals who contract COVIiD-19 despite vaccination have less severe illness than those who are not vaccinated, must be taken into account in demand to wholly comprehend the advantages of COVID-19 immunization. In turn, fostering public confidence and lowering vaccine hesitancy depend on disseminating such findings on vaccine effectiveness (18). According to Kreps et al., the best indicator of COVID-19 vaccination uptake in the US was perceived vaccine efficacy (19). The efficiency of vaccines in preventing disease is a particularly significant argument, according to Sherman et al.'s study on people's attitudes toward vaccines and readiness to get vaccinated against COVID-19 (20).

Figure (3) illustrated the connection between ABO and disease severity. For every category, the difference is not significant (p>0.0001). There were 18 (23.7%) severe cases and 34 (44.8%) blood group O cases. There were 16 (21.1%) non-severe instances, 19 (25%), severe cases (10 and 13.2%), non-severe cases (9 and 21.8%), and blood group B (16 and 21%). AB blood group 7 (9.3%), severe cases 4 (5.3%), non-severe cases 3 (4%), severe cases 6 (7.9%), and non-severe cases 10 (13.1%).

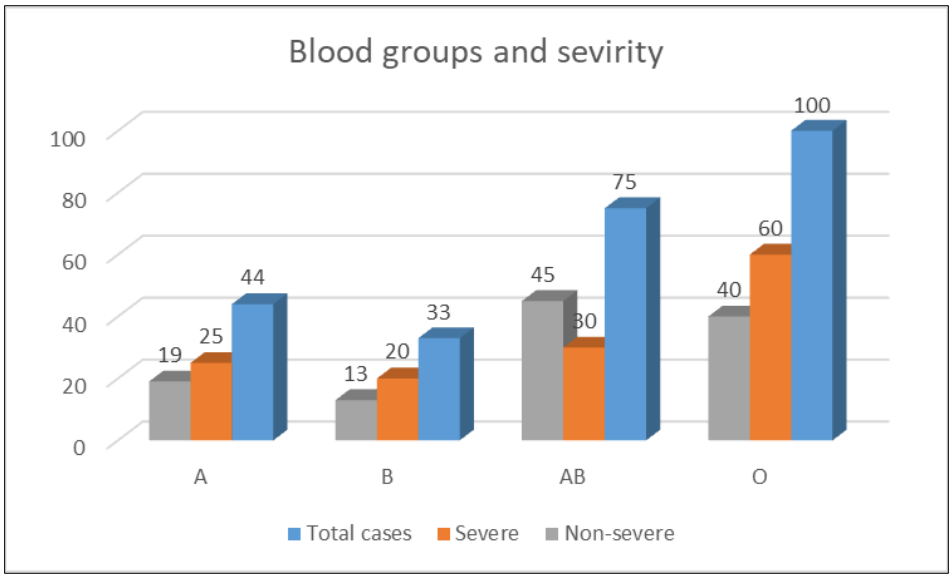

Figure 4 Distribution of blood group and severity of COVID-19 cases

Blood set O could have a protecting effect, however folk cluster A individuals may be more likely to contract COVID-19 and have a complex transience rate than non-A blood group members (21). Additionally, after further stratifying by Rh, it indicated that there was only a substantial connection between A+ (blood type A and Rh+) and O+ (blood type O and Rh+). Since we didn't perform additional studies since there were less Rh blood groups in our samples, this matter requires more investigation and discussion.

Another previous study found that folks with blood assemblage A had a upper chance of contracting COVID-19, but they were unable to determine whether blood group O could guard beside COVID-19 taint. Instead, their study indicated that society with blood group O had a lower peril of severe COVID-19, which was likely caused by the study's small sample size.

Despite the lack of clarity surrounding the role of ABO blood type in COVID-19 infection, we continue to make the following hypotheses based on findings from earlier research. Although blood group antigens are expressed in alveolar and airway epithelial cells as well as in bodily fluids, the ABO blood group is a particular sort of antigen on the erythrocyte membrane (23). First, we hypothesized that the genetic vulnerability of blood group glycoproteins, specifically the invasion mechanism, can operate through binding receptor-mediated affinity. Additionally, Cooling's study demonstrated that blood group antigens are legitimate receptors for certain pathogenic microbes. Given our understanding of the SARS virus, anti-A antibodies may be able to precisely inhibit the adherence of cells that express the SARS-COV S protein (24).

4. Conclusion

- This study was concluded no attachment between blood groups and COVID-19 acceability to infectuion because several differention among Babylon places for infection.
- severity of COVID-19 infection attachment with Rh antigen

4.1. Future study

- We are recommended make genetic study about COVID-19 infection and acceability in different types of blood group in differnet placec of province
- Immunologicsl studies included several parameters (hormonal and hematological) to determine effect of COVID-19 cytokine strom effect on different organs such as pancreas, liver and kidney

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

Statement of ethical approval

Ethics the human study was approved by specific questionnaire detected for this research.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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