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COVID 19- RELATION WITH INFECTIOUS DISEASES VACCINATION AND IMMUNITY

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ABSTRACT

Background: As Covid-19 become pandemic and all the doctors in the world share their experts and knowledge to fight for their countries. Covid-19 on of the diseases that affect mostly the respiratory system which become sever and may cause death to patients. This Covid-19 damaged the health system of all countries in addition to the economy, which lead to a huge crisis for the poverty in the world. **Objective of the study:** To provide the world the factors that affect the severity of the Covid-19. Therefore, the study estimate the proportion of people that have mild, moderate and sever symptoms of Covid-19 with the factors associated with it. **Methods:** A cross sectional study was conducted involving 250 patients with mild, moderate and sever symptoms mimics the Covid-19. data were collected by the physician examining the patient (the researcher) and the severity determined by a scoring system included the common symptoms of the Covid-19. This data analyzed according to proportions and translated. **Results:** The study found that there were a significant association between chicken pox (varicella) and severity of Covid-19 symptoms. there were significant association between IGM for typhoid fever test and the patient had Covid-19 symptoms, but no significant association between IGG test for typhoid and Covid-19. There were no significant association between flulike symptoms last year and flu-shot last year and the severity of covid-19 also we can add the diphtheria, measles mumps and rubella. **Conclusion:** The varicella immunity affect the severity of Covid-19 by cause less severe symptoms. Also there is a relation of typhoid IGM TEST for typhoid as become positive in patients of Covid-19.

KEYWORDS: Covid-19, Infectious Diseases, Vaccination.

INTRODUCTION

Covid-19 is an infectious pandemic disease caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2).[1] Children are not the face of Covid-19 pandemic. While they have thankfully been largely spared from the direct health effects of Covid-19 at least to date.[2] UNICEF Iraq stated on their site that "As of 10 May 2602 Covid-19 cases are confirmed in Iraq (104 deaths) most of the cases reported among the age of 20-59 year. As The researcher Noticed from the start of Covid-19 that the children may be infected by the virus but without or mild symptoms.[3]

From that point the researcher started to ask questions about how can that be possible, it seems that the virus will act as a well biological age clock.

On researches, The CDC study included around 2,500 cases of Covid-19 infection in those under 18 (a small sliver of the total 150,000 confirmed cases in the U.S.

from Feb, 12 to April 2) and it's only the second study of that size; the first came from China and included about 2,100 children aged two to 13 years infected with Covid-19. That study, published in Pediatrics, showed that more than 90% of them experienced no symptoms or mild to moderate ones.[4-5]

That lead the researcher to a theory of might be there is a relation between the vaccination and the severity of Covid-19 or there is a trace of the immune system in those that infected by the certain infectious disease in the past lead to a lesser symptoms of Covid-19.[6]

The researcher found that we could diagnose the patients according to the PCR swap, but unfortunately there were a little available, therefore, we depended upon the clinical signs which provided by the ministry of health Iraq, WHO, and CDC.[7]

Aim of the study

The aim of the study is to estimate relation of Covid-19 mild, moderate and sever symptoms with the history of infectious diseases in patients, these results will lead us to determine the high risk group of patients that may how develop a severe symptoms which may need hospitalization.

Also the will minimize the burden on the hospitals and my colleagues by filtering the patient. On the other hand this will decrease the expenses on the ministry of health which lead a beneficial role for the economy of our country.

METHODOLOGY

Study design: The present study is designed as cross sectional survey.

Study setting and timing: The study started on 1st of April 2020 till 10th of July 2020, the selection of patient took place in the respiratory and private clinic.

The sample: The sample selection based on a non-probability sampling method (purposive sampling), i selected 250 patients in the respiratory and private clinic suspected of having Covid-19 based (with age range from 10 to 90 years) on specific criteria established from the Iraqi ministry of health guidelines, WHO and CDC.

These criteria created a scoring system of disease and its severity on relation to the history of infectious diseases like chicken pox (varicella), measles, rubella and etc.

Data collection

The researcher theory based according to the question of why the children under 12 years old have less symptoms than the older.

The researcher started to collect the data after examining the patient with the laboratory investigation and chest x-ray depending on the scoring system, and categorizing them to mild, moderate and severe and this took about 4 months. Then started testing the results of the percentage of the mild to moderate to severe and there connection with the questions in the score which will determine how many patient had history of infectious diseases in the past with the severity of the diseases.

The components and details of the research instruments: The scoring system that the researcher developed adapted from the Iraqi MOH guidelines of Covid-19 diagnosis, WHO and CDC.[8]

The scoring system of the disease
1- Fever:- 38"C and above measured by the mercury thermometer.
2- Dry cough or sore throat.
3- Headache.
4- Epigastric pain, nausea, vomiting or diarrhea.
5- Difficulty breathing or shortness of breath.

6- Complete Blood Count:- lymphopenia or cytosis
7- On examination crackles (rales), wheezes (rhonchi), stridor, and pleural rubs.
Each point will give "1" score and the 4 score result lead the patient to be selected as suspected case of Covid-19.

2.5.2 The severity scoring

The severity of the disease depending on the scoring system below that created according to the Iraqi MOH guidelines, WHO and CDC, these group of symptoms depending on the physician examination and experience, the physician is a board certified family medicine with 15 years of experience in the medical field:-

For mild
1- fever 38C.
2. Mild headache.
3. SPO2= 99%-96% using a valid oximetry.
4. No CXR Findings.
5. No CT Scan findings.
6. Respiratory rate normal.

For moderate
1- SPO2 = 95% -93%.
2- Chest x-Ray findings (manifestations of pneumonia less than 50% infiltration).
3- CT Chest findings (manifestations of pneumonia less than 50% infiltration).
4. Fever 38c and above.
5. Difficulty breathing or shortness of breath.
6. Respiratory rate below 30.

For severe
1. SPO2=92% and below.
2. Chest X-Ray findings (above 50% infiltration)
3. CT Chest findings (above 50% infiltration).
4. Respiratory rate above 30.
5. On examination crackles (rales), wheezes (rhonchi), stridor and pleural rubs.
6. Fever 38 C and above.

By the scoring system above we can diagnose the Covid-19 patients without the PCR method which is so expensive and many patients refused it. These scoring systems created from the Iraqi ministry of health guidelines, WHO and CDC.

Statistical analysis: The descriptive study was made to fulfill the research objectives, the descriptive studies done by the SPSS windows program, the options used were the descriptive study of average, cross tables and the percentages. Also cross links between the variables to determine the effect of the variable on the severity of the disease. The relationship of nominal variables explored through figures, cross tables for all the variables in the factors list.

RESULTS

At the time conducting this study there were 250 patients gathered from the private clinic respiratory clinic of

Alnumaan hospital. All the patients were included and sampled for the study.

Table (1) showed that among 250 patient were selected regarding the scoring system, there were 128 (51.2%)

males and 122(48.8%) females. The age groups of the patients were divided of three categories (1-12 years) of 0 patients, (13-44years) of 120 with 48% and (45-90 years) of 130 of 52%.

Table (1): Frequency of age and gender.

		Frequency	Percent	Cumulative Percent
Age groups/years	≤ 12	0	0	0
	13-44	120	48	48
	45-90	130	52	100
Gender	Male	128	51.2	51.2
	Female	122	48.8	100.0
	Total	250	100	

The study found that there are many variables that may be effective regarding the severity of the disease. According to the age variable vs the severity the study found that the 13-44 years group were 48% divided to 12 patient of mild cases (10%), 85 patients of moderate cases (70%) and 23 patient of severe cases (20%). The group of (45-90 years) were 52% divided to 12 patient of

mild cases (9%), 66 patients of moderate cases (51%) and 52 patients of severe cases (40%). The results above calculated by the frequencies of all data related then cross tabled with the severity of the cases to identify the percentages of the patients with certain age with the severity as shown in table (2).

Table (2): Age vs Covid 19 severity.

Age group/ years	MILD	Moderate	Severe
	No.(%)	No.(%)	No.(%)
0-12	0(0.0)	0(0.0)	0(0.0)
13-44	12(10.0)	85(70.0)	23(20.0)
45-90	12(9.0)	66(51.0)	52(40.0)

Table (3) demonstrated the Chicken pox (varicella) vs severity of Covid-19 and found that there were 173 patients of total had chicken pox (varicella) in the past of their life (70%) divided into 23 patient of mild cases(13%), 139 patients of moderate cases(80%) and 11 patients of severe cases (7%). Also there were 77 patients of no history of chicken pox (varicella) (30%) divided into 1 patient of mild case (2%), 12 patients of moderate cases (15%) and 64 patients of severe cases (83%).

Therefore, we can analyze the data as follow
There were 24 patients of mild cases divided into 23 patients of chicken pox (varicella) positive history (95%)

and 1 patient of mild case with no history of chicken pox (varicella) (5%). There were 151 patients of moderate cases divided into

139 patients of chicken pox (varicella) positive history (92%) and 12 cases of no history of chicken pox (varicella) (8%).

There were 75 patients of sever3 cases divided into 11 patients of positive history of chicken pox (varicella) (15%) and 64 patients of no history of chicken pox (varicella) (85%).

Table (3): Chicken pox (varicella) Vs Covid-19 Severity.

Chicken pox Hx	Mild	Moderate	Severe	Cumulative%
	No. (%)	No. (%)	No. (%)	
Positive	23(13.0)	139(80.0)	11(7.0)	100
Negative	1(2.0)	12(15.0)	64(83.0)	100
Total	24(15.0)	151(95.0)	75(90.0)	

Table (4) compared the Diphtheria with Covid-19 severity and found that there were 229 patient of no history of diphtheria (92%) divided to 24 patients of mild cases (10%), 141 patients of moderate cases (62%) and 64 patients of severe cases (28%). Also there were 21 patients of unknown status of diphtheria (8%) divided

into zero patient of mild cases, 10 patient of moderate cases (48%) and 11 patients of severe cases (52%).

Table (4): Diphtheria and Covid-19 severity.

Diphtheria	Mild No. (%)	Moderate No. (%)	Severe No. (%)	Cumulative%
Positive	0(0.0)	0(0.0)	0(0.0)	100
Negative	24(10.0)	141(62.0)	64(28.0)	100
Don't know	0(0.0)	10(48.0)	11(52.0)	100

The flulike symptom last year vs severity of Covid-19 was demonstrated in table (5) which elicited that there were 69 patients of no history of flulike symptoms last year (28%) divided as follow

11 patients of mild cases (16%), 36 patients of moderate cases (52%) and 22 patients of severe cases (32%). Also there were 175 patients of positive history of flulike symptoms last year (70%) divided as follows

13 patients of mild cases (8%), 112 patients of moderate cases (64%) and 50 patients of severe cases (28%). There were 6 patients of unknown history of flulike symptoms last year divided as follows

Zero patients for mild cases, 3 patients of moderate cases and 3 patients of severe cases.

Table (5): Flulike symptom last year vs severity of Covid-19.

Flulike	Mild No. (%)	Moderate No. (%)	Severe No. (%)	Cumulative%
Positive	13(8.0)	112(64.0)	50(28.0)	100
Negative	11(16.0)	36(52.0)	22(32.0)	100
Don't know	0(0.0)	3(50.0)	3(50.0)	100

The flu-shots vs severity of Covid-19 showed in table (6). It was found there were 186 patients of no history of flu shot last year (74.4%) divided into 19 patients of mild cases (10%), 113 patients of moderate cases (62%) and 52 patients of severe cases (28%). Also 63 patients of taking the flu-shot last year (25%) divided as follows:-

five patients of mild cases (8%), 37 patients of moderate cases (59%) and 21 patients of severe cases (33%). Therefor there is one patient do not know i he took the flu-shot last year.

Table (6): Flu-shots vs severity of Covid-19.

Flulike	Mild No. (%)	Moderate No. (%)	Severe No. (%)	Cumulative%
Positive	5(8.0)	37(59.0)	21(33.0)	100
Negative	19(10.0)	133(62.0)	52(28.0)	100
Don't know	1(100.0)	0(0.0)	0(0.0)	100

Measles, Mumps and Rubella vs Covid severity was demonstrated in table (7) and found that there were 239 patient of no history of MMR (95%) divided into 24 patient of mild cases (10%), 142 patient of moderate cases (59%) and 73 patients of severe cases (31%). Also

5 patients of positive history of MMR divided into 3 patients of moderate case (60%) and 2 patients of severe cases (40%). There were 6 patients of unknown history of MMR.

Table (7): MMR vs Covid-19 severity.

MMR	Mild No. (%)	Moderate No. (%)	Severe No. (%)	Cumulative%
Positive	0(0.0)	3(60.0)	2(40.0)	100
Negative	24(19.0)	142(59.0)	73(31.0)	100
Total	6(100.0)	0(0.0)	0(0.0)	

IGG and IGM of Typhoid fever vs Covid-19 severity was demonstrated in table (8). It was found that 135 patients tested negative of IGG typhoid (54%) divided into 15 patient of mild cases (11%), 84 patient of moderate cases (63%) and 36 patients of severe cases (26%). Also there were 115 patients that did positive test for IGG Typhoid (46%) divided into 9 patients of mild cases (8%), 67 patients of moderate cases (58%) and 39

patients of severe cases (34%). Also there were 36 patients that tested negative for IGM Typhoid (15%) divided into 9 patients of mild cases (25%), 22 patients of moderate cases (61%) and 5 patients of severe cases (14%). And there were 214 patients (85%) tested positive divided into 15 patients of mild cases (7%), 129 patients of moderate cases (60%) and 70 patients of severe cases (33%).

Table (8): IGM Typhoid vs Covid-19 severity.

		Mild	Moderate	Severe	Cumulative%
		No. (%)	No. (%)	No. (%)	
IGM	Positive	15(7.0)	129(60.0)	70(33.0)	100
	Negative	9(25.0)	22(61.0)	5(14.0)	100
IGG	Positive	9(8.0)	67(58.0)	39(34.0)	100
	Negative	15(11.0)	84(63.0)	36(26.0)	100

Vaccinations vs Covid-19 severity was demonstrated in table (9) and showed that 33 patients (13%) of no history of vaccination divided as follows; 7 patients of moderate cases (21%) and 26 patients of severe cases (79%). Also 200 patients of positive history of vaccinations divided as 21 patients of mild cases (10%), 136 patients of moderate cases (68%) and 43 patients of severe cases (22%). Also there were 17 patients of unknown vaccinations status.

Table (9): Vaccinations vs Covid-19 severity.

Vaccination	Mild	Moderate	Severe	Cumulative%
	No. (%)	No. (%)	No. (%)	
Positive	21(10.0)	136(68.0)	43(22.0)	100
Negative	0(0.0)	7(21.0)	26(79.0)	100
Don't know	17(100.0)	0(0.0)	0(0.0)	100

DISCUSSION

The study found among 250 patients selected the male ratio was more than female in the percentage calculation (51.2%>48.8). Also there were approximately equally ratio between male and female. The study found that there was 48% of total selected patient of age (12-44 years) and 52% of all patients selected of age (45-90 years).

The study found according to the age factor that there were 70% of the aged 12-45 years were moderate cases comparing to the 51% of the 46-90 years, this high percent of moderate cases regarding the age group could be a factor favorable for the severity of Covid-19 factors.

Also the study found that there were 20% of severe cases regarding the age 12-45 years comparing with the 40% of severe cases of the aged 46-90 years, that difference found could favors the age group with the severity of Covid-19.

The study found that from the total of 250 patients which consist of 70% of positive patients of chicken pox (varicella) history 80% of them had less severe symptoms and bounce between mild and moderate cases as 80% moderate and 13% mild cases. These results compared with the negative history of chicken pox (varicella) which were 30% of total patients there were 83% of them of severe cases. Also there were 95% of mild cases with positive history of chicken pox (varicella) comparing with 5% of no history and in moderate cases there were 92% of them of positive history and 8 % of no history.

There were 85% of severe cases with no history of chicken Pox comparing with 15% with positive history. These results above could be analyzed as chicken Pox (varicella) infection from the past could protect some how from the severity of Covid-19.

According to the results of the study, there were 92% of patients of no history of diphtheria of mild cases of 10% and moderate of 62%.

According to the results of the study there were 32 % of severe cases of no history of flu like symptoms comparing with 28% of positive history.

The simple difference between them could be analyzed therefore, as no relation of Covid 19 and flulike symptom history.

According to the results there were 10 % of mild cases with no history of flu-shots comparing with 8% of positive history, also there were 62% of moderate cases of negative history. Also there were 28% of severe cases of negative history comparing with 33% of positive history. Therefore, the percentages had slight difference between them, this could be analyzed as there is no effect of the flu-shots in the last year with the severity of Covid-19.

The study found that were few patients of positive history of MMR infections so the researcher cannot compare the percentages.

The study found that there were 54% of patients tested negative for IGG typhoid and 46% tested positive. Also there were 85% of patients selected as could be Covid-19 tested positive for IGM Typhoid and only 15% tested negative. There could be analyzed as there may be relation between the IGM Typhoid and the Covid-19 patients.

The study found that among the vaccinated patients there were 10% mild cases, 68% moderate and 22% severe. Therefore, this could be interpreted as there is a relation between the vaccinated patients and the severity of Covid-19.

CONCLUSION

There were no difference in severity of Covid-19 symptoms between male and female. The age factors could have effect on the symptoms of Covid-19. There were a strong effect of chicken pox (varicella) history of patients with the severity of the Covid-19, as it could be protective from the severity of the symptoms. While there were no effect of flulike symptom last year and the flu-shot last year with the severity of Covid-19 symptoms. There were a strong factors with the patients suspected to be positive Covid-19 and the IGM test of typhoid.

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