

The Effect of Covid 19 on the Heart Rate in Children

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Abstract: Background: Covid 19 affects children's heartbeats positively, as it causes a disorder in which the heart rate is fast and irregular, which causes poor blood circulation and can lead to clots or even a stroke. **Objective:** This study aims to study the effect of Covid 19 on the heart rate in children. **Patients and Methods:** In this study, an analytical study was conducted to find out the effect of Covid 19 on the heart rate of children and their quality of life. This study was divided into two groups, the first was 100 patients, and the second was 100 control patients. This study included age, sex, percentile, weight (kg), height (cm), body mass index (kg/m²), clinical presentation, n (%), asymptomatic, and mild. **Results and Discussion:** Studies indicate that children are less affected than adults in terms of their exposure to Covid-19, as pediatric patients respond to the Covid virus differently. In this study, the overall criteria were described by the patient test, which included a BMI of 14.5 ± 1.4 for the patient group and 14.7 ± 1.5 for the control group with a P value of 0.049. This study also showed laboratory results. The most characteristic in Table 2 are 11.6 ± 1.3 for patients and 12.6 ± 7 for the control group with a P value of 0.048, and the second is platelets which included 260 ± 71.2 patients and 263 ± 73.5 control group. **Conclusion:** Children are considered the most affected by Covid-19 disease, which has been confirmed by all studies that Covid disease greatly affects heart function. This study concluded that the control group is less affected than the patients' group.

Keywords: Covid 19; Asymptomatic; Mild; IVRT; QRS.

INTRODUCTION

Other complications of COVID-19 include tachycardia, an arrhythmia that can weaken the heart and lead to heart failure and, in some cases, sudden death.

Although the prevalence of clinically significant heart disease after suffering from COVID-19 causes inflammation of the heart muscle after COVID-19 (and in extremely rare cases, after receiving mRNA vaccines), a study of adult patients who had recently recovered from COVID-19 indicated that 60% of them had myocarditis, regardless of how severe the COVID symptoms were during the infection. Symptoms of myocarditis can include chest pain, shortness of breath, irregular heartbeat, and fatigue. Children and adolescents who have had moderate or severe symptoms should be through the six months.

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Patients with the SARS-CoV-2 coronavirus, commonly known as COVID-19, usually present with respiratory symptoms, but in more severe cases, it can lead to cardiovascular and multi-system involvement. Ten million three hundred seven thousand thirty-nine cases worldwide with 506,473 deaths; In Colombia, there have been 91,995 diagnosed cases and 3,256 deaths. Despite the poor prognosis of infection, which alters the real mortality rate, it has been shown to be a disease capable of collapsing health systems in some countries.

Many researches about COVID-19 have been published and stated that some symptoms of infection, such as cough, shortness of breath, heart palpitations, and chest pain, can be mistaken for an underlying cardiovascular origin and are important to consider in the differential diagnosis. In addition, having a previous cardiovascular disease is associated with a five times higher mortality rate; Finally, COVID-19 disease can have myocardial compromise, either due to myocarditis or ischemia, which seriously impairs the prognosis.

Millions of American children and teens have tested positive for SARS-CoV-2, the virus that causes COVID-19. Fortunately, they were less likely than adults to develop severe cases of the disease. However, despite having few or no symptoms, children can develop some other conditions after the infection that causes COVID-19. Some are minors and may go away on their own. Others are more serious and may need treatment.

Smell and taste. One in four children and adolescents between the ages of 10 and 19 who develop COVID have changes in their sense of smell and taste. This can have a negative impact on your eating habits and mood. It can also prevent them from smelling dangerous. These symptoms usually disappear within several weeks. When that doesn't happen, your child's doctor may recommend steps to test or retrain those senses.

The relationship between COVID-19 disease and sudden death is not being evaluated. An investigation by the Italian National Institute of Health found an unexplained increase in deaths in nursing homes during the COVID-19 pandemic. Similarly, a study investigated the behavior of deaths in the provinces hardest hit by SARS-CoV-2 in Italy and found that cardiac arrests outside the hospital for medical reasons, house arrest, and cases of cardiac arrest were not seen. By 6.5, 7.3, and 11.3 percentage points, respectively. In addition, the score for unsuccessful resuscitation was shown to increase by 14.9%.

Although there could be multiple reasons for these data, such as respiratory failure due to COVID-19 in patients taking too long for a consultation, serious life-threatening events of cardiac or extracardiac origin, and failure to visit the emergency room for fear of infection, it cannot be ruled out. Having a direct relationship with COVID-19 and sudden cardiac death.

There is no data on what happens to background arrhythmias in patients with COVID-19. Since there is an association between atrial fibrillation

(AF) and sepsis, the events may be exacerbated. Likewise, in the face of severe infection and increased metabolic demands, the incidence of ventricular arrhythmias may increase in patients with underlying heart disease.

There is a clear relationship between arrhythmias and the severity of COVID-19. The development of myocardial injury associated with COVID-19 is not uncommon and is associated with the onset of arrhythmias. This study aims to study the effect of Covid 19 on the heart rate in children.

PATIENTS AND METHODS

In this study, an analytical study was conducted to find out the effect of Covid 19 on the heart rate of children and their quality of life. This study was divided into two groups, the first was 100 patients, and the second was 100 control patients. This study included age, sex, percentile, weight (kg), height (cm), body mass index (kg/m²), clinical presentation, n (%), asymptomatic, and mild, as shown in Table. 1.

In addition, the control group and 200 patients were tested for analysis of all laboratory characteristics, which included WBC, neutrophils, lymphocytes, hematograms, platelets, and CRP, as shown in Figure 2. The ECG parameters of the patient and control groups were also studied: QT, maximum, QT, minimum, QRS, Tp-Te, Tp-Te/QT, and Tp-Te/QTc, which you can see in Table 3.

Univariate logistic regression analysis for mortality and morbidity was performed in Table 4 to evaluate all factors affecting the patients and the control group, where the symptoms that occurred in children were studied, which included fever, cough, loss of taste and smell, diarrhea, and chills as displayed in Table 5. and nasal congestion. In Table 6, the patient's outcomes are estimated in comparison to the control group for each of the R correlations, Sig, which were assessed on both boys and girls, as shown in Table 6.

RESULTS

Table 1: Characteristics of demographic results of patients

Variables	Patients (N=100)	Control (N=100)	P-value
Age	10±4.3	9.4±4.5	0.048
Sex, %			
Boys	60%	55%	0.044
Girls	40%	45%	0.044
Weight (Kg)	20.6±4.4	21±5.1	0.048

Height (cm)	124±5.2	126±6.3	0.045
BMI (kg/m ²)	14.5±1.4	14.7±1.5	0.049
Clinical presentation, n (%)			
Asymptomatic	57 (57%)	50 (50%)	0.0463
Mild	43 (43%)	50 (50%)	0.043

Table 2: Laboratory characteristics

Parameters	Patients (100)	Control (100)	P-value
WBC × 10 ⁹ /L	5.25±3.3	5.43±3.2	0.043
Mean neutrophil × 10 ⁹ /L	4.1±1.4	4.3±1.6	0.0411
Mean lymphocyte × 10 ⁹ /L	2.64±1.4	2.4±1.5	0.044
Mean hemogram g/dL	11.6±1.3	12.6±7	0.048
Mean platelets × 10 ⁹ /L	260±71.2	263±73.5	0.043
Mean CRP, mg/L	8.6±15.2	8.6±15.4	0.047

Type 3: ECG parameters of the patient and control groups

Parameters	Patients (100)	Control (100)	P-value
QT, maximum, ms	310 (260-450)	312 (305-360)	0.034
QT, minimum, ms	280 (270-220)	280 (275-330)	0.0355
QRS (msn)	65.3 ±9.84	52.11±4.1	0.045
Tp-Te (msn)	90.55±74	76±12	0.0258
Tp-Te/QT	0.43±0.0046	0.135±0.0043	0.023
Tp-Te/QTc	0.354±0.05	0.135±0.065	0.0378

Type 4: Analysis of univariate logistic regression of mortality and morbidity

Parameters	Patients (100)	Control (100)	P-value
Age	2 (2%)	1 (1%)	0.048
Sex			
Boys	2 (2%)	2 (2%)	0.05
Girls	3 (3%)	1 (1%)	0.047
Tp-Te	8 (8%)	2 (2%)	0.036
Tp-Te/Qt	7 (7%)	1 (1%)	0.031
Tp-Te/QtC	6 (6%)	3 (3%)	0.042
QT, minimum	5 (5%)	1 (1%)	0.041
QT, maximum	1 (1%)	2 (2%)	0.047
QRS	4 (4%)	1 (1%)	0.041
IVRT	2 (2%)	1 (1%)	0.049

Type 5: Distributions of patients according to symptoms

Parameters	Patients (100)	Control (100)	P-value
Fever	32%	25%	0.039
Cough	24%	23%	0.048
loss of taste or smell	12%	14%	0.046
diarrhoea	9%	19%	0.026
Chills	12%	11%	0.0483
Nasal congestion	11%	8%	0.041

Table 6: Estimation of outcomes of patients in comparison with control

Variable	Outcome's relevance of children	Patients	Control
R correlation	1/0	+0.72	-0.23
Sig	--	0.061	0.65
N		200	

DISCUSSION

Studies indicate that children are less affected than adults in terms of their exposure to Covid-19, as pediatric patients respond to the Covid virus differently. In this study, the overall criteria were described by the patient test, which included a BMI of 14.5 ± 1.4 for the patient group and 14.7 ± 1.5 for the control group with a P value of 0.049. In addition, the British study showed that clinical presentation for children is less severe than for adults, and it does not show any clinical symptoms for all newborns, adolescents, and children in general with COVID-19, and this was proven by this study, as it included Asymptomatic patients 57% and for the control group 50%, while for the control group 50% Mild for patients 43% and control group 50% with a P value of 0.043 as shown in Table 1.

This study also showed laboratory results. The most characteristic in Table 2 are 11.6 ± 1.3 for patients and 12.6 ± 7 for the control group with a P value of 0.048, and the second is platelets which included 260 ± 71.2 patients and 263 ± 73.5 control group.

According to the ECG parameters of the patient and control groups, this study comprehensively evaluated demarcation parameters by relying on the following intervals, which included QT, maximum, QT, minimum, QRS, Tp-Te, Tp-Te/QT, Tp-Te/ The QTc where QRS presented in Table 3 for the patients was 65.3 ± 9.84 and the control group 52.11 ± 4.1 with a P value of 0.045. This study considered that the percentage of patients who had more arrhythmia than control in the electrocardiogram

Table 4 shows QT, minimum for both control group 1 (1%) and patients' group 2 (2%) with a P-value of 0.049 considering that QT, minimum 5 (5%) for patients and 1 (1%) for the control group as Shown in Table 4 with a lower rate of IVRT for patients 2 (2%) and 1 (1%) for the control group since the German study confirmed that low IVRT and high Tp-Te, Tp-Te/QT, and Tp-Te/QTc can cause irregularities. Heartbeat.

With the evaluation of symptoms for each of the patient group and the control group, where the American study confirmed that fever and cough are the most common on the nails, where cough included 24% for patients and 23% for the control group with a P value of 0.048, as well as Fever 32% for patients while 25% for the control group with a P value 0.039 is shown in Table 5. This

study was conducted to assess patients and control groups by relying on R correlation +0.72 for patients and -0.23 for the control group, while Sig included 0.061 for the patients' group and 0.65 for the control group.

CONCLUSION

Children are considered the most affected by Covid-19 disease, and which has been confirmed by all studies that Covid disease greatly affects heart function. This study was conducted ECG for the following parameters Tp-Te, Tp-Te/QT, and Tp-Te/QTc, where this study confirmed that low IVRT and high Tp-Te and Tp-Te/QT and Tp-Te/QTc can cause arrhythmias. Based on that, this study concluded that the control group is less affected than the patient group.

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Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:

Yahya, A.T.T., Al khuwayldee, H.K.M., Hazim, R.F., Abdulkafi, A.Q. and Jumaah, A.A.W. "The Effect of Covid 19 on the Heart Rate in Children." *Sarcouncil journal of Medical sciences* 1.10 (2022): pp 30-34.