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Study of some blood indicators for non-infected with COVID-19 virus and those vaccinated with Pfizer, AstraZeneca and Sinopharm in Babil Governorate

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Abstract--The study included determining the extent of the effect of common vaccines for the Corona virus (COVID-19). Based on some blood tests of people not previously infected with the virus. From vaccinated and not vaccinated with Corona virus (COVID-19) vaccines, and of both sexes, a total number of 280 people. 70 samples of Pfizer vaccine, 70 Sinopharm, and 70 AstraZeneca. In addition to 70 samples for the control group for ages between (18-70) years, during the period from October 2021 to the end of April 2022. The highest value of blood count readings (WBC) was recorded for those vaccinated with AstraZeneca, which was (7.8), and the highest value was recorded The (RBC) for those vaccinated with Pfizer was [5.4], while the highest value for (Hb) was recorded for those vaccinated with Pfizer and it was (15.3). As for (PCV), the highest percentage of it was in the people vaccinated with AstraZeneca and Sinofam (43.8 and 43.0), and the highest percentage of (PLT) was for those vaccinated with Pfizer and Sinopharma (269.0 and 270.6), respectively. By comparing the results to the control group between the vaccinated and the unvaccinated, as well as between the type of vaccine, there were no significant statistical and moral differences and effects preventing the use of these vaccines against Corona Virus (COVID-19). They are safe and have no side effects on the blood count.

Keywords--blood, COVID-19, vaccinated, AstraZeneca, Sinopharm.

Introduction

Corona virus (Covid-19) first appeared in December 2019 and has spread around the world since late 2019, with an unprecedented number of cases and deaths globally. (Lutrick *et al.*, 2021), confirmed (Chou & Budenz, 2020) It is a highly contagious respiratory disease that infected more than 100 million people during the first year of the epidemic all over the world, and the world tried to address it by finding an appropriate vaccine to control the disease. In December 2020, the World Health Organization approved the use of the Pfizer vaccine, which is the first vaccine to be used against disease (Covid-19), and then it was followed by other vaccines, such as the ChAdOx1 nCoV-19 vector vaccine and Sinopharm (Hyams *et al.*, 2021).

Blood Cells

White blood cells (WBC) play an important role in the immune system, the process of phagocytosis, defense and protection of the body against infection that involves the occurrence of fatal diseases, acute and chronic diseases that arise due to viruses, bacteria, parasites, fungi, etc. by eliminating them, and the diagnosis of the number of types of WBC is considered Blood images are one of the important tests in diagnosing many blood-related diseases (Wang *et al.*, 2022). Red blood cells (RBC) are the most abundant cell type in the body and thanks to their flexible structure, they have the ability to pass through all blood vessels (Huisjes *et al.*, 2018), and they are essential in the respiratory system where they work to transport oxygen to all cells and tissues, delivering carbon dioxide to the lungs. (Bain, 2017). Hemoglobin (Hb) Hemoglobin is a complex protein made up of heme and globin. It is made in immature RBCs by the bone marrow. (Abd-Zaid, 2015) The primary function of hemoglobin is to transport oxygen to cells and remove carbon dioxide from tissue cells (Georgy-Gey & Parker, 2003).

Hematocrit is the percentage of total blood that measures the volume of red blood cells (RBC) in relation to whole blood, i.e. the blood's ability to carry oxygen. It is used to check for anemia (low number of red blood cells) or polycythemia (Chidozie *et al.*, 2020). Platelets (PLT) are small nucleated cells that travel in the form of discs in the blood circulation, and they play a major role in cardiovascular disease, both in the development of atherosclerosis and thrombosis, and they also have many roles other than thrombosis (Laura *et al.*, 2018). This study aims to assess the vital indicators of people vaccinated with the Pfizer, AstraZeneca and Sinopharma vaccines and the extent of the effect of these common vaccines for the Corona virus (COVID-19) on some blood indicators of people who were not previously infected with the virus from those vaccinated and not vaccinated with Corona virus vaccines and of both sexes, including -: Measurement of the number of red blood cells (RBC) and white blood cells (WBC), hemoglobin concentration (Hb), and the determination of the proportion of the volume of stacked red cells (HTC) and platelets (PLT) in the blood serum.

Materials and working methods

This study was conducted during a period of time starting from October 2021 to the end of April 2022, and the number of study samples amounted to 280 blood

samples from people vaccinated with vaccines, Pfizer, AstraZeneca, Sinopharm and a control group not infected with COVID-19 virus and not vaccinated (70 samples). For each vaccine (males and females) within my age range between (18-70) years, samples were collected from hospitals (Musayyib, Alexandria, Al-Seddah) and their health centers, then the samples were taken to private laboratories to conduct analyzes within the province of Babylon .Blood samples were collected by drawing venous blood and placed in glass tubes containing an anticoagulant substance (EDTA-K3), then gently agitated for two minutes using a shaker to set and measure the complete blood picture. Complete blood count was performed using an automated blood analyzer (Sysmex-KX-21N, Japanese). (Assig, 2021.)

Statistical analysis

The results were expressed as the mean \pm standard deviation, and the results were statistically analyzed using the statistical program (SPSS) according to the availability of its latest version (SPSS V28-2021)

Results and Discussion

Comparison of blood counts with vaccinated and unvaccinated persons

The results of the current study, which are shown in Table (1), Figure (1 and 2) showed the highest value of the blood count (WBC) for those vaccinated with AstraZeneca and it was (7.8), and the highest value of (RBC) for those vaccinated with Pfizer was recorded and it was (5.4), while the highest value was recorded For (Hb) for those vaccinated with Pfizer and it was (15.3). As for (PCV), the highest percentage of it was in the people vaccinated with AstraZeneca and Sinofam (43.8 and (43.0) respectively, and the highest percentage of (PLT) for those vaccinated with Pfizer and Sinopharma (269.0 and 270.6), respectively, and by comparing the results to the control group between the vaccinated and the unvaccinated, as well as between the type of vaccine, there were no significant statistical and moral differences and effects at the level of significance ($P \leq 0.05$.) Where studies have shown that the Pfizer vaccine is safe and effective for the majority of the population, it provides a high level of protection, as it can be licensed for emergency use (Anand & Stahel, 2021), while another study indicated the effectiveness of the Oxford-AstraZeneca (ChAdOx1 nCoV-19) vaccine, where it is valued by an evaluation committee. The Pharmacovigilance risks of the European Medicines Agency (EMA) on March 18, 2021 as a safe and effective vaccine that contributes to the control of the COVID-19 pandemic and that the benefits of the vaccine outweigh the risks and can contribute to the control of the COVID-19 pandemic.(Tobaiqy *et al.*, 2021) (Voysey *et al.*, 2021) As for the Sinopharm vaccine, studies have shown that it is generally safe and widely used for the prevention of respiratory diseases, as well as other infectious diseases (Al Kaabi *et al.*, 2021).

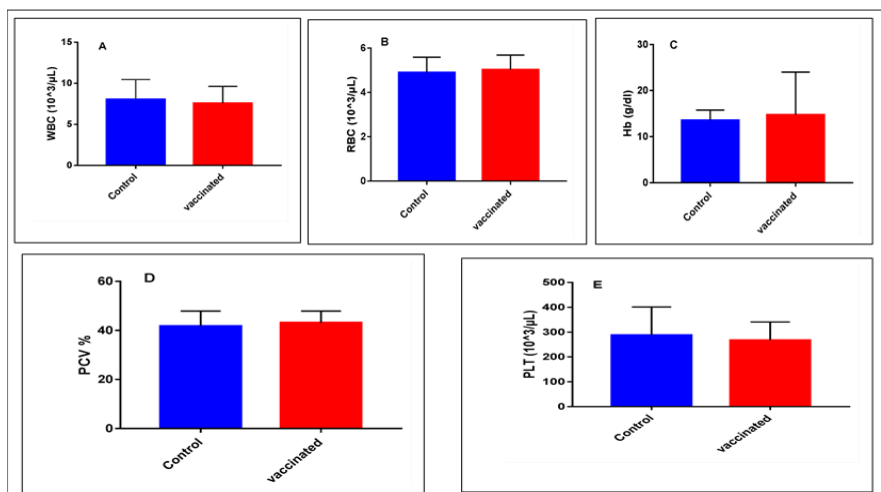


Figure 1. A comparison of some blood tests with vaccinated and unvaccinated people

Table 1
The effect of the type of vaccine on some blood tests

Case	WBC		RBC		Hb		PCV		PLT	
	Mean ± SD	P. value	Mean ± SD	P. value	Mean ± SD	P. value	Mean± SD	P. value	Mean ± SD	P. value
Control	8.0±2.4	0.24	4.9±0.6	0.52	13.5±2.2	0.57	41.7±6.1	0.06	288.3±68.2	0.26
AstraZeneca	7.8±2.1	0.61	5.0±0.8	0.64	14.2±1.7	0.59	43.8±4.7	0.02	260.5±79.3	0.05
Pfizer	7.6±2.1	0.23	5.4±1.1	0.15	15.3±2.5	0.17	41.8±5.8	0.83	269.0±60.8	0.16
Sinopharm	7.3±1.9	0.05	5.0±0.6	0.71	14.1±1.9	0.63	43.0±5.2	0.14	270.6±79.2	0.21

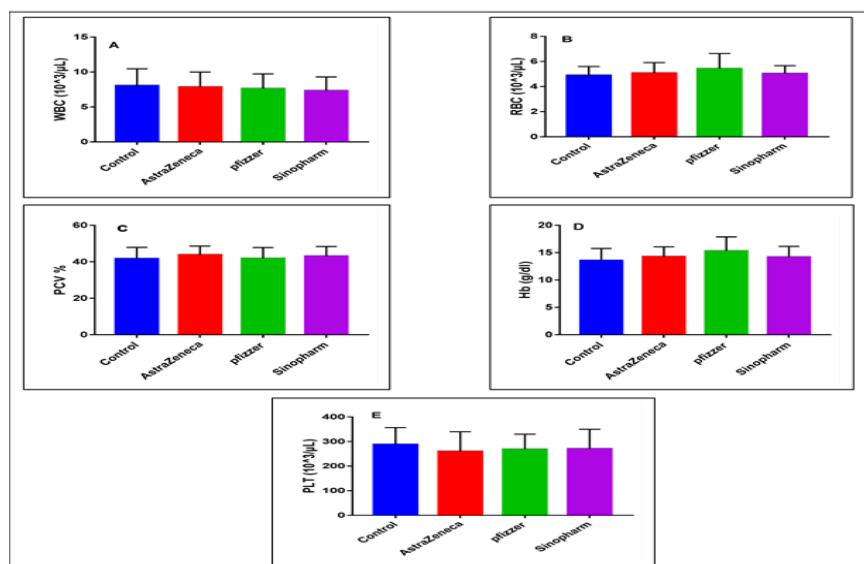


Figure 2. The effect of the type of vaccine on some blood tests

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