Case report

Oxford-AstraZeneca Vaccine for COVID-19*:* A Case Report

Mehdi Pooladi[1,2*], Soheila Karani[1]

Abstract

The design and development of a vaccine against the new coronavirus obtain an essential goal of the global health community, which has developed and approved several vaccines, including the Oxford-AstraZeneca vaccine. The vaccine has been challenged because of reports of side effects after vaccination, while the level of immunity created by the vaccine has been confirmed. In this study, we examined the complication and changes in laboratory tests of hematology, biochemistry, and enzymology in a 42-year-old woman with no history of specific disease after receiving the Oxford-AstraZeneca vaccine for 7 days. Our studies showed that following the injection of the vaccine, platelet, RBC, WBC decreased and increased D-Dimer rates. Also that the standard rate has changed between neutrophils, lymphocytes, and monocytes. There is evidence of Prothrombotic Immune Thrombocytopenia, and following that, there is a risk of the embolism, but the particular point is that this complication is temporary, and the test process is progressing towards recovery.

Keywords: Oxford-AstraZeneca, COVID-19, Vaccine

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Please cite this article as: Pooladi M, Karani S. Oxford-AstraZeneca Vaccine for COVID-19*:* A Case Report. J Cell Mol Anesth. 2021;6(4):346-51. DOI: https://doi.org/10.22037/jcma.v6i4.34860

Introduction

The new coronavirus remains a global challenge that has mobilized academic researchers and politicians to control and manage this pandemic (1, 2). Typically manufacturing a vaccine to prevent and control COVID-19 is a research program of many scientific centers. With the development of several vaccines, including Oxford-AstraZeneca, Sputnik-V, Bharat Biotech's Vaccine, Moderna-RNA, and NTech-RNA-Pfizer/Bio, the treatment system hopes to control this pandemic (3). There have been several reports of side effects of COVID-19 vaccines, including controversial reports of Prothrombotic Immune Thrombocytopenia caused by the injection of Oxford-AstraZeneca vaccine, which raises doubts about injecting, suspending, or preventing vaccination with this specific type of vaccine has been developed (4, 5). In generals, venous thromboembolism (VTE) clinically includes Deep venous thrombosis (DVT) and Pulmonary Embolism (PE). In a review, we remind that the resulting embolism can naturally include a clot of insoluble substances in the blood that typically demonstrate the potential to disrupt the typical movement of blood in the arteries, and the result of this complication is stroke. This clot can remain a community of red blood cells, fat, or gas bubbles that circulate freely in the circulatory system. Therefore, these mobile masses are a potential hazard. Small or large embolus blocks the arteries, directly related to the number of masses created (6). There have been confirmed and unconfirmed reports of the embolism after the Oxford-AstraZeneca vaccine injection, but it

is not yet clear how or what the potential risks are (7).

Research has shown Oxford-AstraZeneca provides an optimal level of immunity and resistance to the SARS-CoV-2 B.1.1.7 mutant virus. This research was conducted in the UK and obtained confirmation of previous studies. The WHO has also confirmed the practical effect of this vaccine, but its efficacy conditions are different for the virus detected in South Africa. A limited study found Oxford-AstraZeneca could not represent a good to moderate coating for SARS-CoV-2 B.1.35, so Oxford-AstraZeneca vaccine in South Africa was suspended (8, 9).

In this article, we have scientifically investigated platelet, WBC, and RBC abnormalities after Oxford-AstraZeneca vaccine injection in a woman also assessed the risk of clot-blood formation. Besides, the complication reported in this article happened to one of the authors of this article.

Case Report

This study was performed on a 42-year-old woman with no history of a specific disease and a history of standard laboratory tests. Full consent was landed for this research after providing the necessary explanations, and also this research has been done granting to the ethical protocols of research centers.

On April 20, 2021, the volunteer received a dose of the Oxford-AstraZeneca vaccine to provide immunity against SARS-CoV-2. About 8 hours after receiving the vaccine, the first and most predictable symptoms appear fever, body aches, pain and spasm at the injection site, anorexia, and weakness. These symptoms continued intermittently and with varying severity for four days. About 36 hours after the vaccine was injected, the person suffered a sudden drop in blood pressure, and then because of a faint, she urgently was taken to a hospital emergency department due and was given first aid.

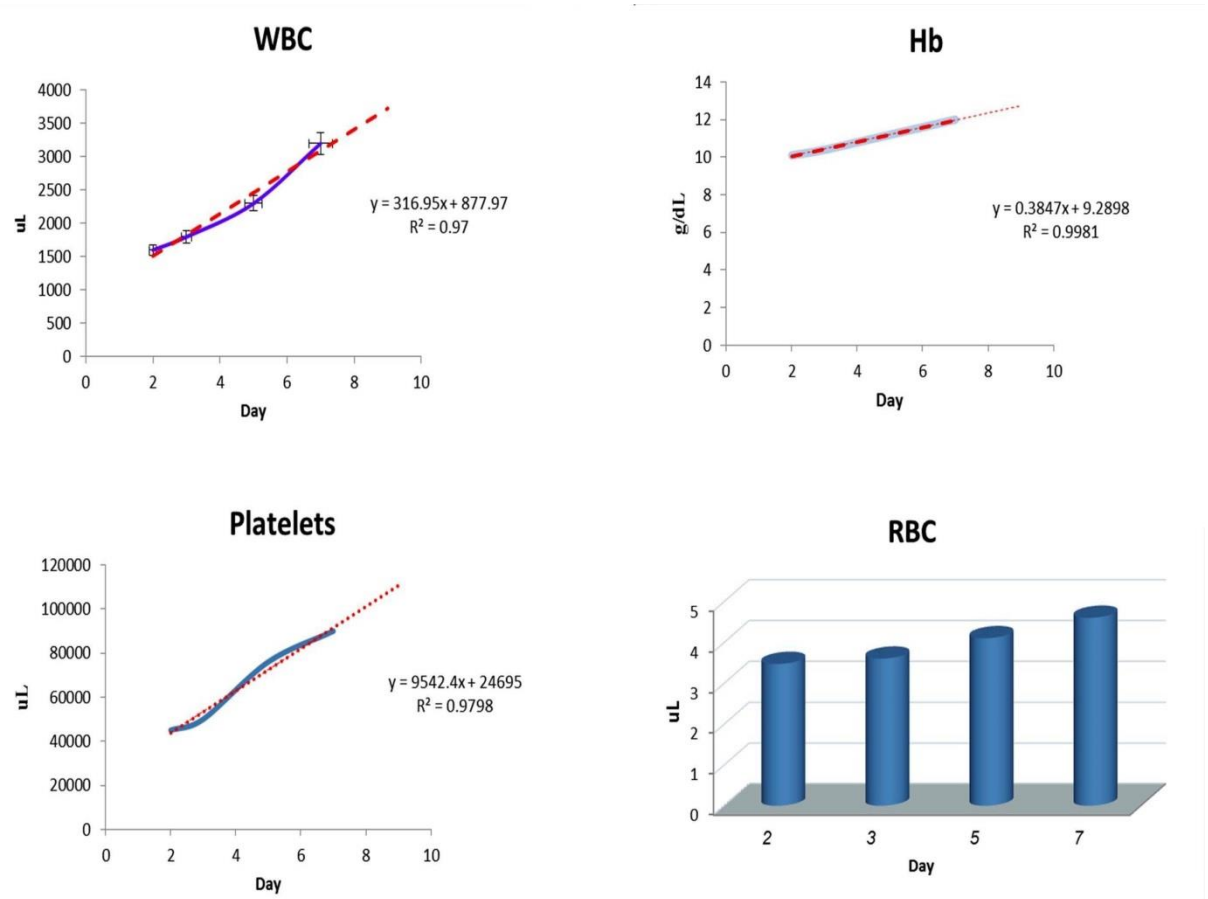

Figure 1. Blood cell and platelet count after Oxford-AstraZeneca vaccine injection for the second, fifth and seventh days. If R2 is more nearby to one, therefore the error rate is less.

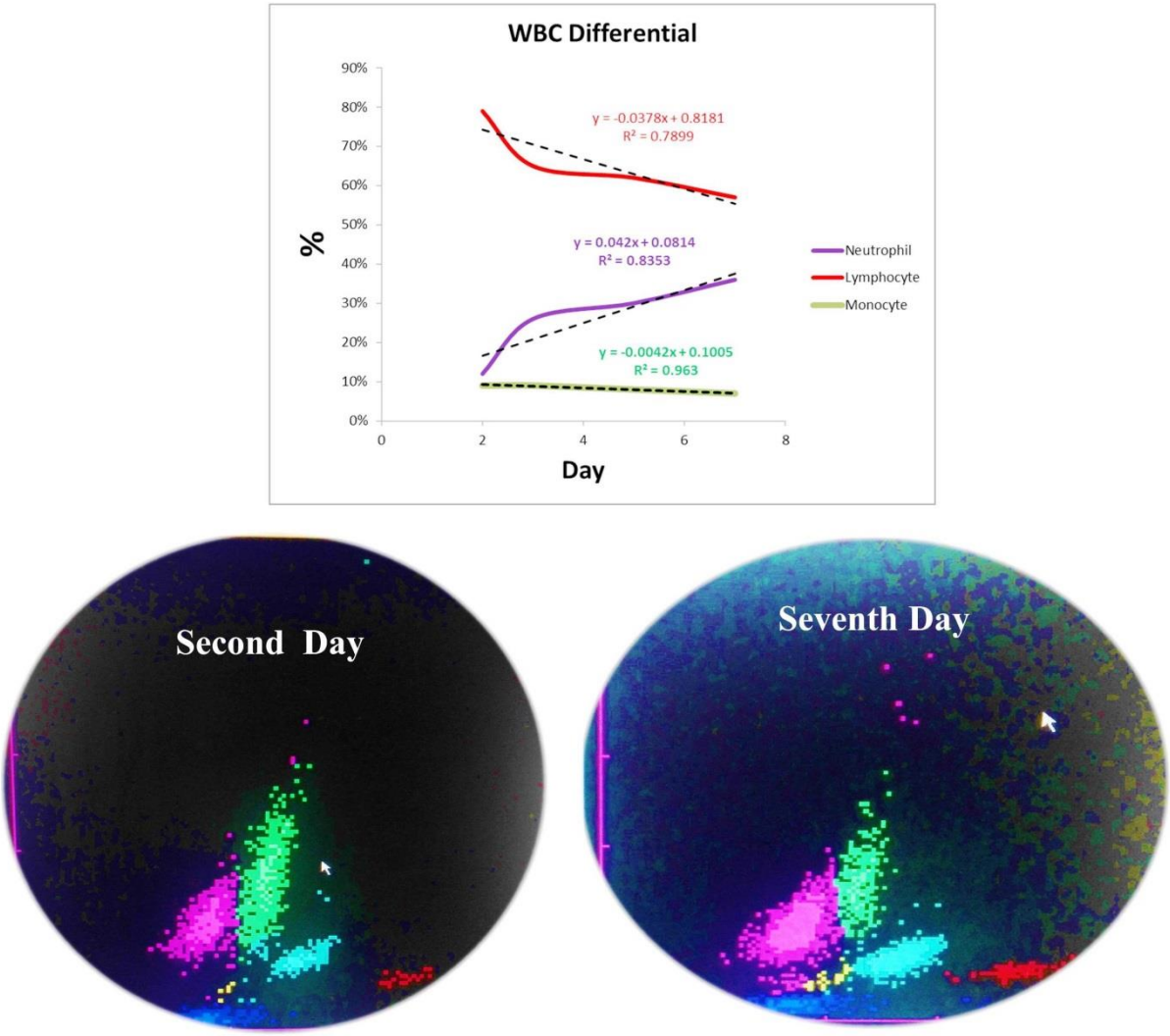

Figure 2. Evaluation of WBC changes after Oxford-AstraZeneca vaccine injection for the second, fifth and seventh days. If R2 is more nearby to one, therefore the error rate is less.

Blood samples were taken on the second, third, fifth, and seventh days after vaccination and repeated three times for each test. Samples include:

- Whole blood (EDTA) for platelet, RBC, and WBC differences count
- Plasma (Sodium Citrate) for PT, INR, PTT, Fibrinogen, and D-Dimer
- Serum (clot) for biochemical, enzymatic, and hormonal tests

In this study, platelet count and WBC differences (Neutrophil, Lymphocyte, and Monocyte) to device check (i800 cell) and in addition to were Checked the method Peripheral Blood Smears (PBS) again and then report. The sensitive device [DF-8100, iran] was used for the plasma test, and D-Dimer (ng/ml) test was performed by the VIDAS device [VIDAS® D-Dimer ExclusionTM II (France)]. All biochemistry and enzymology tests were performed by Hitachi device [@HitachiGlobal, Japan], all tests according to each test's standard protocol.

During the four stages of blood sampling and laboratory testing, it was discovered that after receiving a dose of the Oxford-AstraZeneca vaccine, the platelet (PBS) and WBC count decreased significantly. We demonstrate the recorded values for important blood factors in Figure 1. Furthermore, WBC differences are indicated in Figure 2, which Expresses a change in the percentage of neutrophils and Lymphocytes compared to the Patient history and

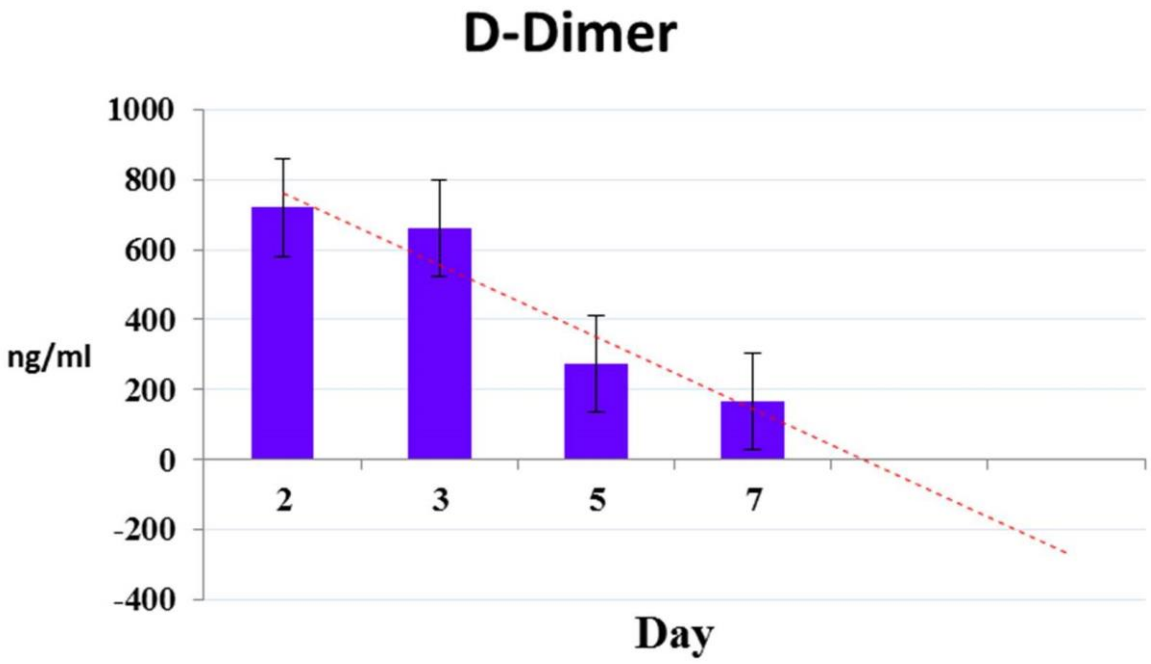

Figure 3. D-Dimer changes during 7 days after vaccination with Oxford-AstraZeneca.

normal state before vaccination. The amount of D-Dimer recorded in the first stage of blood sampling also increased compared to the average level (<500). Figure 3 shows the amount of D-Dimer returned to minimize risk in the fourth stage of blood sampling.

All routine biochemistry and enzymology tests (BUN, Creatinine, LFT, Troponin, Amylase, Lipase, and Electrolytes) plus PT, INR, PTT, and Fibrinogen are reported to be completely normal and have not changed significantly compared to a person's history.

Discussion

In this article, we report a complication after a single dose of Oxford-AstraZeneca vaccine injection. Our preliminary results showed a decrease in platelets, RBC, Hb, and WBC, which are temporary and can be due to micro-clotting in the blood, but no specific cause was found for the disorder in WBC differences and needs further investigation. Customarily, we try to adopt a fair approach and examine the negative and positive opinions.

Reports indicate that the Oxford-AstraZeneca vaccine injection provides an optimal level of resistance against COVID-19 (10). But National Advisory Committee on Immunization (NACI), an official body in Canada, has suspended the Oxford-AstraZeneca vaccine for people under 55. This action obtains the recording of European reports of the risk of several cases of Blood Clots in vaccinated people. Most of these European reports are provided by Germany. Standing Committee on Vaccination (STIKO) in Germany has suspended Oxford-AstraZeneca vaccination for people under 60, except that STIkO, unlike NaCl, receives a long-term suspension. Germany has reported 31 cases of cerebral thrombosis out of 2.7 million doses of Oxford-AstraZeneca injected and granting to these reports, four other countries, including Denmark, Latvia, the Netherlands, and Sweden, have stopped Oxford-AstraZeneca vaccination. However, countries like France, Iceland, Lithuania, and Germany have only imposed age restrictions. Medicines Agency European (EMA) has not yet confirmed Germany's reports, and many European countries, including Spain and the United Kingdom, have not imposed suspensions. In general, there have been ambiguities and doubts about the injection or suspension of the Oxford-AstraZeneca vaccine (11-13). The EMA has approved a total of 62 Cerebral Venous Sinus Thrombosis (CVST) and 24 Deep Vein Thrombosis (DVT) by March 23, 2021,

with a total of 18 deaths. In a significant difference, the NACL estimates the death rate at 40 percent! Which needs further investigation (11, 14, 15).

Opponents of the Oxford-AstraZeneca vaccine injection suspension against COVID-19 point out that 30% of patients with COVID-19 develop thrombocytopenia, with previous research showing that pulmonary embolism occurs in 7% and venous thrombosis in 11%. It created a total of 23% of COVID-19 patients admitted to the ICU develop VTE, which is about 2% of deaths due to stroke (16,17). Another view refers to the side effects of heparin, which is an anticoagulant and can cause thrombocytopenia. Statistics show that this complication is 1 in 250 thousand cases (18). There are still approved drugs that cause the effect of blood clotting, including contraceptives, which are far less necessary to use (19). In addition to medication, other factors cause blood clots to form, like air travel (20). Most recently, in an article, Jemielniak and Krempovych questioned the adverse reports about the Oxford-AstraZeneca vaccine. They attribute this volume of adverse reports to the retweeting of news and point to factors such as the involvement of rival countries (21).

Conclusion

Granting to the personal history of previous experiments in the individual and the results obtained after effective vaccination with Oxford-AstraZeneca, it is clear that in at least one case of vaccine injection on platelets, WBC and RBC caused a decreasing effect on the numbers, and the rate of increase in D-Dimer in the early days after from the injection, which is evidence for the formation of micro-clots in the blood that causes thrombocytopenia in the individual. The crucial point is that these side effects are temporary, and after about 7 days without medication, they have been involved in the therapeutic process. For this reason, we recommend that everyone is monitored following receiving the Oxford-AstraZeneca vaccine injection.

Acknowledgment

None.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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