

## Original Research Article

# A survey on psychological effects following administration of the first dose of COVID-19 (Oxford-AstraZeneca-Covishield) vaccine in Sri Lanka: experience among the medical community

Warnakula Weerasooriya Jayathilaka Sashka Madushi Rowel<sup>1\*</sup>,  
Kodithuwakku Arachchilage Sajith Uditha Asanka Kodithuwakku<sup>2</sup>,  
Jayawardhana Mudiyanseelage Pradeepa Sanjeewa<sup>2</sup>

<sup>1</sup>Department of Psychiatry, Victorian Institute of Forensic Mental Health, Sri Lanka

<sup>2</sup>Department of Obstetrician and Gynecologist, Ministry of Health, Sri Lanka

**Received:** 27 March 2021

**Accepted:** 29 April 2021

### \*Correspondence:

Dr. Warnakula Weerasooriya Jayathilaka Sashka Madushi Rowel,  
E-mail: madushi1985@yahoo.com

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

**Background:** Research on psychoimmunology has demonstrated a bidirectional relationship between the immune system and the brain. Although the evidence is conflicting, few studies are suggesting a temporal association between neuropsychiatric disorders and some vaccines. However, research is scarce in this area. We observed that some recipients experienced various transient psychological symptoms in addition to physical symptoms following administration of the first dose of Oxford-AstraZeneca-Covishield vaccine in Sri Lanka. The objective of this survey was to assess the nature, associations and duration of the psychological symptoms observed following the vaccine.

**Methods:** A cross-sectional online survey was conducted among the medical community in the age range of 25-63 years, who received the first dose of the vaccine. The questionnaire inquired demographic details, physical symptoms, psychological symptoms, duration of symptoms and their view on taking the second dose and recommending it to family or friends.

**Results:** The majority (94.6%) of the participants had experienced some form of a physical symptom and 85.2% experienced at least one psychological symptom. Those who had fever experienced a higher rate of psychological symptoms compared to those who hadn't. However, this difference was not significant. The majority developed symptoms after 12 hours of receiving the vaccine and the symptoms lasted for less than 48 hours.

**Conclusions:** Notable rates of psychological symptoms were observed in recipients of the first dose of Oxford-AstraZeneca-Covishield vaccine. However, these symptoms were self-limiting. Further studies are needed to ascertain if these observations are significant.

**Keywords:** Oxford-AstraZeneca-Covishield vaccine, Psychological symptoms, Sri Lanka

## INTRODUCTION

COVID-19 has been declared as a global pandemic by the world health organization while many Government, institutions, and communities around the world are grappling with its impact. Vaccination is recognized as a possible long-term solution for the COVID-19 pandemic

and different countries have developed and trialed various vaccines against the virus.

Sri Lanka began vaccinating its frontline workers from late January 2021 with the Oxford-AstraZeneca-Covishield vaccine (ChAdOx1 nCoV-19), which was developed in the United Kingdom (UK) and manufactured in India.

The vaccine contains a sequence of SARS-CoV-2 spike protein along with a tissue plasminogen activator (tPA) leader sequence in a replication-deficient simian adenovirus vector used as a platform.<sup>1,2</sup> At the time of writing this article, the consensus supported that giving the second dose after 12 weeks from the first dose provides the best immunity boosting effect.

Psychoneuroimmunology is a concept based on the principle of bidirectional association between the immune system and the brain, which has been demonstrated by various studies.<sup>3</sup> Although the pathophysiology behind is unclear there is some evidence indicating that the immune system plays a key role in the development of several neuropsychiatric disorders.<sup>4</sup> O'Connor et al reported that psychological factors such as depressive and anxiety symptoms predict the immune response to the meningococcal vaccine.<sup>5</sup> Guloksuz et al in their pilot case-control study showed a temporal relationship between the new onset of neuropsychiatric disorders and the time of vaccination.<sup>6</sup> These studies have highlighted the need for further research in this area.

It was observed that some of the recipients experienced various transient physical symptoms as well as psychological symptoms following administration of the first dose of the Oxford-AstraZeneca-Covishield vaccine. These short-term physical symptoms have been recognised and studied locally as well as globally. However, the psychological symptoms observed following the vaccine have not been addressed in any of the studies to date. This is the first ever survey that looks at the transient psychological symptoms following administration of the Oxford-AstraZeneca-Covishield vaccine to the best of our knowledge.

## METHODS

The survey was conducted among the medical doctors between 25-63 years of age, who received the first dose of the Oxford-AstraZeneca-Covishield vaccine in late January and early February 2021.

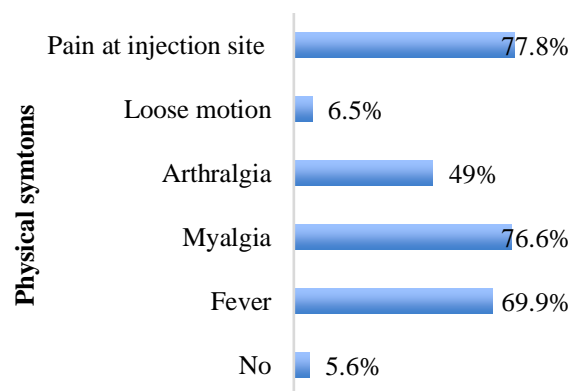
The questions used in the survey were extracted from few studies conducted to assess the psychological symptoms following different vaccines and medications.<sup>5-8</sup> Some modifications were done to make the questions more relevant to the Sri Lankan context.

The questionnaire was prepared using Google forms and the link was forwarded to over 500 medical doctors who had received the first dose of the Oxford-AstraZeneca-Covishield vaccine using social media. The participants were kept anonymous. The questions on demographic data included gender and the age group. There was a question on physical symptoms following vaccination including pain at the injection site, arthralgia, myalgia, fever and loose motions. 11 questions were included on various psychological symptoms, which focused mainly on anxiety and depression. Two questions were about the

onset and duration of symptoms. The last two questions inquired if they would take the second dose of the vaccine and if they would recommend it to a friend or family. Participants were allowed to respond with a 'yes' / 'no' or 'may be' for the questions on psychological symptoms. The percentages of responses were calculated using Microsoft Excel and correlated with demographic data. A subgroup analysis was done for the two groups who did and didn't have a fever to see if there is an association between physical and psychological symptoms.

## RESULTS

The majority of respondents (93.5%) were between 25 to 45 years of age. Only 6.5% was above 46 years. 51.7% of the respondents were male and 48.3% were female. 94.4% of the respondents had experienced some form of physical symptom following vaccination. The most frequent physical symptom was pain at the injection site and 5.6% had not experienced any physical symptom (Figure 1). Between the genders, 95.8% of females and 93.0% of males had experienced some form of physical symptom. In the 25–34-year age group, 93.9% had some physical symptom and that for the 35-44 years age group was 95.4%.



**Figure 1: Physical symptoms following the vaccine.**

The most frequently reported psychological symptom was persistent fatiguability, which was reported by 42.0% of the participants. Also, biological symptoms of depression such as sleep disturbances and appetite disturbances were reported by 38.4% and 37.2% of the participants respectively. 33.5% reported having a lack of motivation and slowness. Also, 31.2% reported having a lack of enjoyment. 25.3% reported having difficulty in experiencing pleasant emotions, while 24.3% reported difficulty in concentration. Symptoms of anxiety such as difficulty in relaxation and worrying thoughts were reported by 18.4% and 10% of participants respectively. 5.6% of the participants reported having nightmares. Table.3 shows a summary of data on psychological symptoms. Female participants reported having persistent fatiguability and loss of appetite more frequently compared to males (47.4% vs. 25.9% and 41.3% vs.

33.3% respectively), while an inability to experience pleasant emotions and difficulty in concentration was more common among females (28.1 % vs. 22.5% and 26.3% vs. 22.5% respectively). Excessive worrying was more prevalent in the 25-34 years age group compared to

the 35-44 years age group (11.9% vs. 6.62% respectively). Irritability and sleep disturbances were more frequent in the 35-44 years age group than the 25-34 years age group (17.2% vs. 12.6% and 42.4% vs. 37.9% respectively).

**Table 1: Psychological symptoms reported following the vaccine.**

Psychological symptom	Yes, N (%)	No. N (%)	May be , N (%)
<b>Fatiguability</b>	185 (42.0)	209 (47.4)	47 (10.7)
<b>Inability to experience pleasant emotions</b>	112 (25.3)	269 (60.7)	62 (14.0)
<b>Feeling irritable and annoyed more often</b>	70 (15.8)	330 (74.5)	43 (9.7)
<b>Inability to experience pleasure</b>	138 (31.2)	253 (51.7)	52 (11.7)
<b>Sleep disturbances</b>	171 (38.4)	253 (56.9)	21 (4.7)
<b>Nightmares</b>	25 (5.6)	405 (91.4)	13 (2.9)
<b>Loss of appetite</b>	165 (37.2)	260 (58.6)	19 (4.3)
<b>Difficulty in concentrating after the vaccine</b>	108 (24.3)	300 (67.6)	36 (8.1)
<b>Lack of motivation or slowness</b>	148 (33.5)	260 (58.8)	34 (7.7)
<b>Excessive worrying</b>	44 (10.0)	368 (83.4)	29 (6.6)
<b>Difficulty to relax</b>	81 (18.4)	328 (74.4)	32 (7.3)

**Table 2: Psychological symptoms in those who had a fever vs. no fever.**

Psychological symptom	Fever (%)	No fever (%)
<b>Fatiguability</b>	47.5	27.6
<b>Inability to experience pleasant emotions</b>	29.9	14.1
<b>Feeling irritable and annoyed more often</b>	19.3	7.4
<b>Inability to experience pleasure</b>	33.8	24.6
<b>Sleep disturbances</b>	45.9	20.8
<b>Nightmares</b>	6.1	4.4
<b>Loss of appetite</b>	46.9	14.1
<b>Difficulty in concentrating after the vaccine</b>	29.6	11.9
<b>Lack of motivation or slowness</b>	39.5	18.6
<b>Excessive worrying</b>	11.2	6.8
<b>Difficulty to relax</b>	21.5	10.4

The experience of psychological symptoms in those who had a fever and those who did not is depicted in (Table 2). Experience of psychological symptoms was higher in the group who had a fever. However, it was not statistically significant ( $p=0.993$ ). The majority (63.7%) developed psychological symptoms between 12 hours-24 hours after receiving the vaccine, while 17.3% did within 12 hours. 13.4% of the participants started experiencing psychological symptoms between 24-48 hours and only 5.6% developed symptoms after 48 hours following the vaccination. In most (68.4%) symptoms persisted only for 48 hours or less and in 9.7% symptoms lasted for more than 72 hours. Out of the participants, 92.8% reported that they would consider a second dose of the vaccine. However, 4.3% were not certain and 2.9% disclosed that they would not take the second dose. 93.7% revealed that they would recommend the vaccine to their family/friends, while 4.1% were uncertain and 2.3% did not want to recommend it to their family/friends and.

## DISCUSSION

This survey explored the experience of psychological effects following administration of the first dose of the Oxford-AstraZeneca-Covishield vaccine among the medical community in Sri Lanka. The principal findings of this survey are as follows: 94.6% had experienced some form of physical symptom following the vaccine and the most frequently experienced physical symptom was pain at the injection site, followed by myalgia then fever. 85.2% experienced at least one psychological symptom included in the questionnaire. Those who had fever experienced a higher rate of psychological symptoms, than those who did not have a fever. However, the difference was not statistically significant. The majority developed symptoms after 12 hours of receiving the vaccine and lasted for less than 48 hours. More than 90% reported that they would take the second dose and they would recommend it to a friend or family.

A single-blind randomized-controlled trial for the ChAdOx1 nCoV-19 vaccine conducted in the UK involving young/older adults revealed that at least one local symptom was reported by 88% in the 18-55 years age group and 73% in the 56-69 years age group after administration of the first dose.<sup>9</sup> This trial used the same vaccine and reported a lower rate of physical symptoms compared to ours. However, they had not looked at the psychological symptoms following vaccination.

Sah et al in their article regarding the experience of Oxford AstraZeneca COVID-19 Covishield vaccination in Nepal, reported similar physical symptoms among the recipients.<sup>10</sup> Also, they had experienced irritability of mood following vaccination. These observations were done among the health and security workers in Nepal, where the study population was similar to ours. However, the above article was on the quality of their experience and hadn't mentioned any quantitative data to compare the results.

The psychological symptoms experienced following the vaccine could have occurred owing to many reasons. One possibility is a direct effect of bidirectional neuro-immunological response following the vaccine. Several studies have supported this theory demonstrating the nature of the linkage between the immune system, nervous system and psychological processes.<sup>5</sup> A study done by Guloksuz et al revealed that influenza vaccination in children and adolescents was associated with new-onset anorexia nervosa, obsessive-compulsive disorder and anxiety disorder.<sup>6</sup> On the other hand, a study done by a group of researchers in Ohio state university, Columbus involving older adults revealed that pre-existing depressive symptoms could lead to amplified/prolonged inflammatory responses following Influenza virus vaccination.<sup>7</sup> However, there is no adequate data in our survey to attribute the psychological symptoms observed to a direct neuro-immunological effect of the vaccine.

Fatiguability and biological symptoms of depression such as sleep disturbances and loss of appetite were the most frequently reported symptoms. These psychological symptoms may occur as a consequence of physical symptoms such as fever, experienced following vaccination. In our survey as well, the experience of psychological symptoms was more common among those who had a fever. However, the difference was not statistically significant. Also, these psychological symptoms could be related to personal beliefs and attitudes towards the vaccine.

A majority reported that they had psychological symptoms lasting for 48 hours or less. Only 9.7% of the symptoms lasted for more than 72 hours. This may be useful information in reassuring the future recipients of the vaccine on what to expect after.

### **Limitations**

This survey does have limitations as it involved only the medical doctors and the sample size was limited to 445, and the majorities (92.8%) were in the 25-44 years age group. This could be a result of using social media for the distribution of the questionnaire.

### **CONCLUSION**

The recipients may develop psychological symptoms along with physical symptoms following the administration of the Covishield vaccine. However, these symptoms are transient and self-limiting. This information could be used to alleviate any ambiguity regarding side effects and reassure future recipients of the vaccine. Further studies and replications are needed with increased sample size and with the involvement of the general public communities to assess if these findings are valid and generalizable.

### **ACKNOWLEDGEMENTS**

Authors are extremely grateful to all the doctors who took part in this survey.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

### **REFERENCES**

1. Arashkia A, Jalilvand S, Mohajel N, Afchangi A, Azadmanesh K, et al. Severe acute respiratory syndrome-coronavirus-2 spike (S) protein based vaccine candidates: State of the art and future prospects. *Rev Med Virol*. 2020;e2183.
2. Watanabe Y, Mendonça L, Allen ER, Howe A, Lee M, Allen JD, et al. Native-like SARS-CoV-2 spike glycoprotein expressed by ChAdOx1 nCoV-19/AZD1222 vaccine. *bioRxiv*. 2021;7(4):594-602.
3. Ader R, Cohen N, Felten D. Psychoneuro-immunology: interactions between the nervous system and the immune system. *Lancet*. 1995; 345(8942):99-103.
4. Leckman JF, Vaccarino FM. Editorial commentary: "What does immunology have to do with brain development and neuropsychiatric disorders?". *Brain Res*. 2015;1617:1-6.
5. O'Connor TG, Moynihan JA, Wyman PA, Carnahan J, Lofthus G, Quataert SA, et al. Depressive symptoms and immune response to meningococcal conjugate vaccine in early adolescence. *Dev Psychopathol*. 2014;26(4):1567-76.
6. Leslie DL, Kobre RA, Richmand BJ, Aktan Guloksuz S, Leckman JF. Temporal association of certain neuropsychiatric disorders following vaccination of children and adolescents: a pilot case-control study. *Front Psychiatry*. 2017;8:3.

7. Glaser R, Robles TF, Sheridan J, Malarkey WB, Kiecolt-Glaser JK. Mild depressive symptoms are associated with amplified and prolonged inflammatory responses after influenza virus vaccination in older adults. *Arch Gen Psychiatry*. 2003;60(10):1009-14.
8. Jang FL, Kao PH. The potential use of using the psychological side effects of antidepressants in treating cancer patients. *Taiwan J Psychia*. 2019; 33:227-8.
9. Ramasamy MN, Minassian AM, Ewer KJ, Flaxman AL, Folegatti PM, Owens DR, et al. Safety and immunogenicity of ChAdOx1 nCoV-19 vaccine administered in a prime-boost regimen in young and old adults (COV002): a single-blind, randomised, controlled, phase 2/3 trial. *Lancet*. 2021; 396(10267):1979-93.
10. Sah R, Shrestha S, Mehta R, Sah SK, Rabaan AA, Dhama K, et al. AZD1222 (Covishield) vaccination for COVID-19: Experiences, challenges, and solutions in Nepal. *Travel Med Infect Dis*. 2021;40:101989.

**Cite this article as:** Rowel WWJSM, Kodithuwakku KASUA, Sanjeewa JMP. A survey on psychological effects following administration of the first dose of COVID-19 (Oxford-AstraZeneca-Covishield) vaccine in Sri Lanka: experience among the medical community. *Int J Community Med Public Health* 2021;8:2625-9.