

# Visual Field Defect following CoronaVac (SinoVac) COVID-19 Vaccination : A Case Report

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**Purpose:** This is the first case report detailing a one-month-follow up of bilateral permanent visual field defect, without any brain pathology, after CoronaVac (SinoVac) COVID-19 vaccination that was confirmed by Computerized visual field (CTVF) 30-2

**Background:** According to official data published by the World Health Organization as of May 21<sup>st</sup> 2021, more than 165 million cases have been confirmed to be infected by SARS-CoV-2 (Severe acute respiratory syndrome coronavirus 2) caused COVID-19 (coronavirus disease 2019) pandemic, lead to over 3.4 million deaths.<sup>1</sup>

CoronaVac, also known as the Sinovac COVID-19 vaccine,<sup>2</sup> is an inactivated virus COVID-19 vaccine developed by the Chinese company Sinovac Biotech.<sup>3</sup> It was Phase III clinical trials in Brazil,<sup>4</sup> Chile,<sup>5</sup> Indonesia,<sup>6</sup> Philippines<sup>7</sup> and Turkey<sup>8</sup> and relies on traditional technology similar to BBIBP-CorV (Sinopharm Covid-19 vaccine) and BBV152 (Bharat Biotech's COVID-19 vaccine), other inactivated-virus COVID-19 vaccines.<sup>9</sup> CoronaVac does not need to be frozen and both the final product and the raw material for formulating CoronaVac can be transported refrigerated at 2-8 °C (36-46 °F).<sup>10</sup>

In February 2021, Thailand approved an emergency state<sup>11</sup> and started its vaccination program on 27<sup>th</sup> February.<sup>12</sup> As of May, Thailand had received 3.5 million doses with another 2 million to arrive later.<sup>13</sup>

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## Introduction

According to “Guidelines for adverse reactions after vaccination reported stroke-like syndrome”, When vaccinating a large number of people at the same time there will have a chance to encounter adverse reactions. Various reports of vaccination side-effects have caused a lot of anxiety which can contribute to the

phenomenon known as “Immunization Stress-Related Response (ISRR)”. These symptoms include feeling faint, abdominal pain, nausea, blurred vision, high blood pressure and increased heart rate but a normal neuroimaging study. It is more common in women than men, especially in young people. Symptoms usually completely self-resolve in 1-3 days.<sup>14</sup>

On April 25<sup>th</sup>, 2021, the Institute of Neurology and the Neurology Society of Thailand have studied the side effects of vaccination against COVID-19, including numbness, weakness, blurred speech or blurred vision. Currently, the mechanism of side-effects is

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currently being examined, according to the World Health Organization (WHO). Symptoms can be completely resolved in under 24 hours, while the least may be up to 72 hours.<sup>15</sup>

The adverse effects of the inactivated CoronaVac vaccine have not been fully characterized. Visual impairment is one of the uncommon side effect which usually resolves over a couple of days.<sup>16</sup> Chaisiri et al report 2 hours of blurred vision after the second dose of COVID-19 vaccination.<sup>17</sup>

This case report concerns the 1-month-follow up case of bilateral permanent visual field defect, without any brain pathology, after COVID-19 vaccination (CoronaVac, Sinovac Biotech Ltd., Beijing, China)

### Case Presentation

This study was performed in accordance with the tenets of the Declaration of Helsinki, The Council for International Organizations of Medical Sciences (CIOMS) and International Conference on Harmonization's Good Clinical Practice Guidelines (ICH GCP). Approval to conduct this study was obtained from the

Institutional Review Board Royal Thai Army Medical Department No.IRBTA724/2564.

A 35 year old healthy male presented with sudden painless blur vision both eyes 26 hours after received the second dose of CoronaVac (SinoVac) vaccine in May 2021. He has no history of medication use, alcohol drinking, caffeine intake or smoking. He had 1.5 litres of water before and 0.5 litres after receiving the vaccine. According to the records, the patient received the first dose of vaccine 4 weeks before. After receiving the first dose of vaccine, he has itching lasting approximately 30 minutes.

Extensive ophthalmic examination was conducted. The best corrected visual acuity (BCVA) was 20/20 both eyes by EDTRS charts. Intraocular pressure (IOP), using noncontact airpuff tonometry, was 9 mmHg on right eye and 8 mmHg on left eye. Neither intra-ocular inflammation nor relative afferent pupillary defect (RAPD) was detected. Slit lamp examination, fundus examination, color vision test, and Optical coherence tomography (OCT) macular were normal (Figure 1).

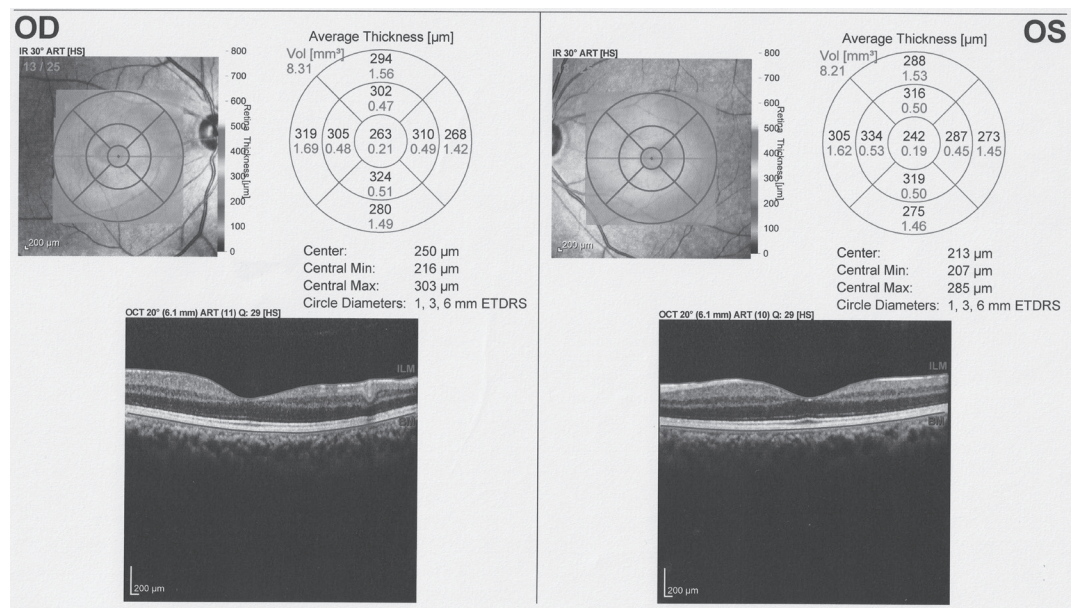


**Figure 1** Macular Optical coherence tomography (OCT macular)

On Computerized visual field (CTVF) 30-2, Humphy Field Analyzer HFA750i, we found Right incongruous homonymous hemianopia (Figure 2). Laboratory investigations include Complete blood count, Blood urea nitrogen, Creatinine, Electrolytes, Lipid profile, Dextrostix and Fasting blood sugar were normal. Echocardiogram, Brain Computerized Tomography Scan and Computed Tomographic Angiography were performed in the same day after having blurred vision, therefore Brain

Magnetic Resonance Imaging and Magnetic Resonance Angiography were performed 3 day later which shown normal study. The patient received Aspirin(81mg), Plavix (75mg), Atorvastatin (40mg), Intravenous 0.9% Normal saline solution daily for 7 days. He was closely followed up daily. Seven days (Figure 2-8) and one month later (Figure 9) of CTVF 30-2 still showed Right incongruous homonymous visual field defect.

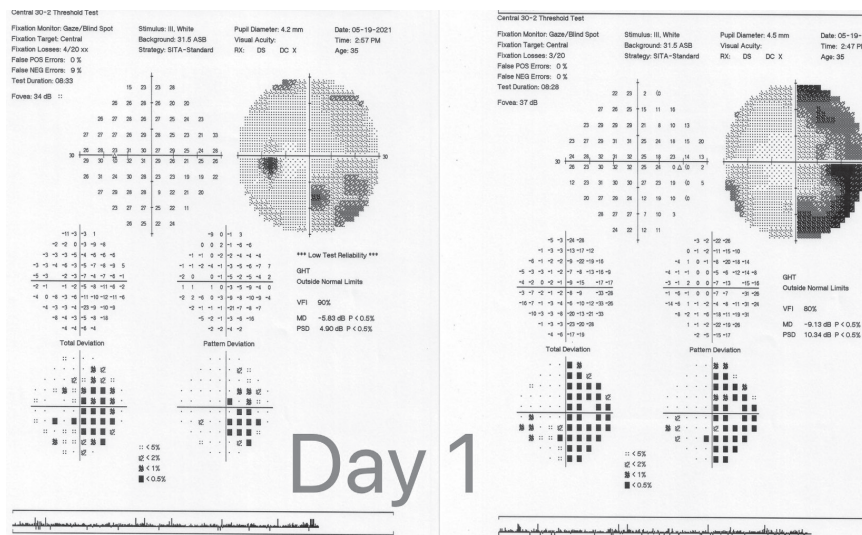


**Figure 2** Computerized visual field (CTVF) 30-2 : Day 1

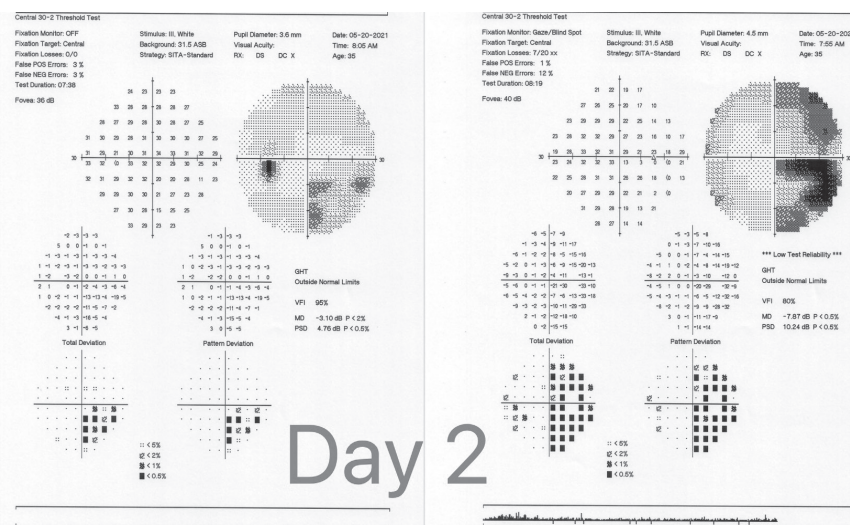


**Figure 3** Computerized visual field (CTVF) 30-2 : Day 2

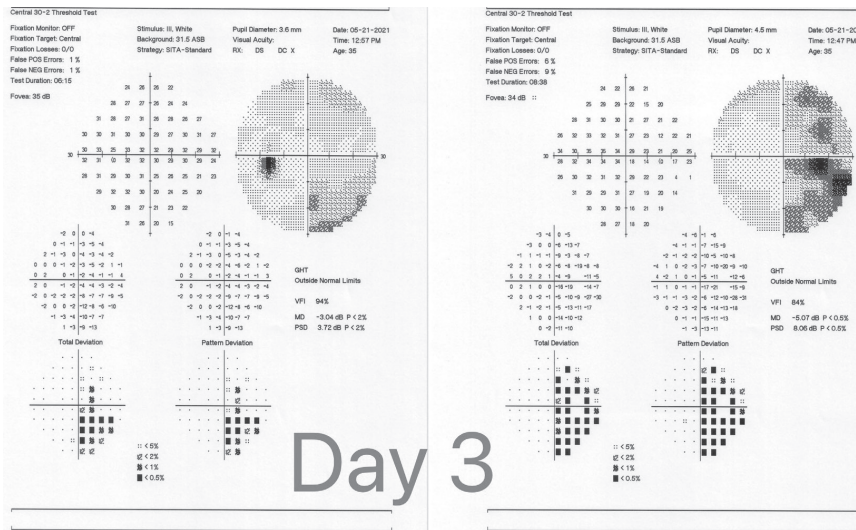


Figure 4 Computerized visual field (CTVF) 30-2 : Day 3

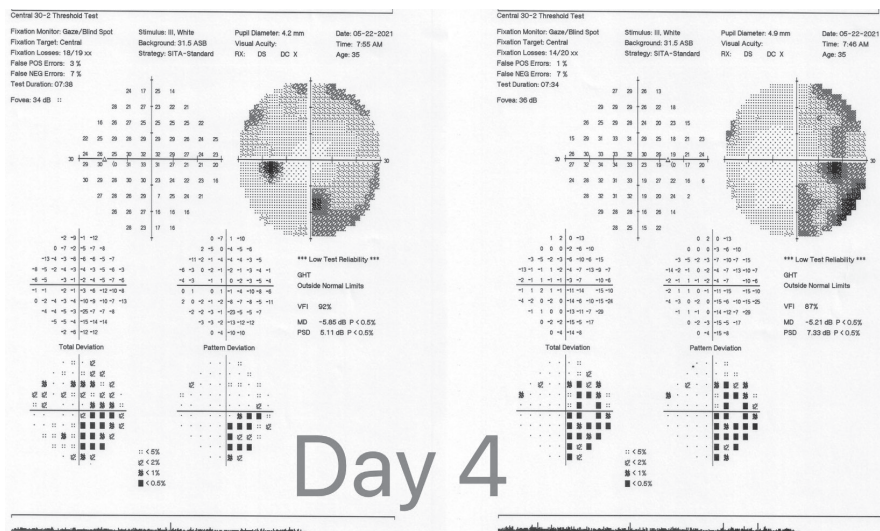


Figure 5 Computerized visual field (CTVF) 30-2 : Day 4

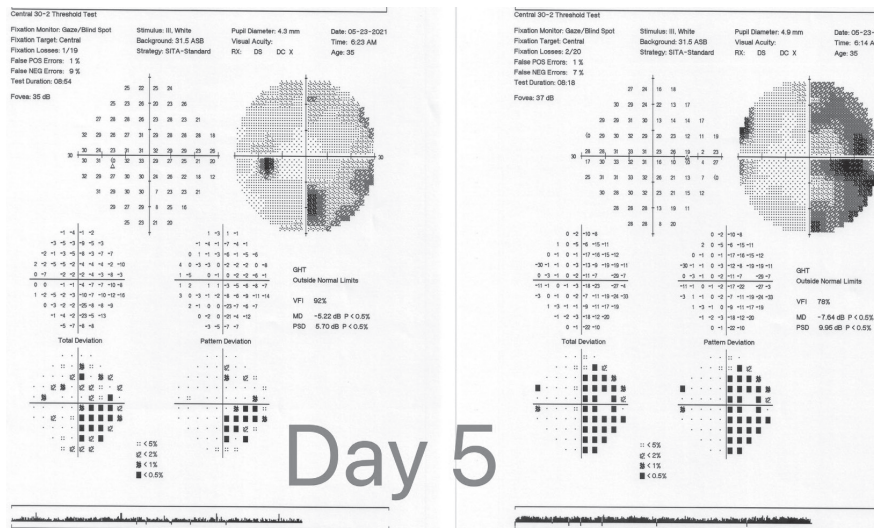


Figure 6 Computerized visual field (CTVF) 30-2 : Day 5

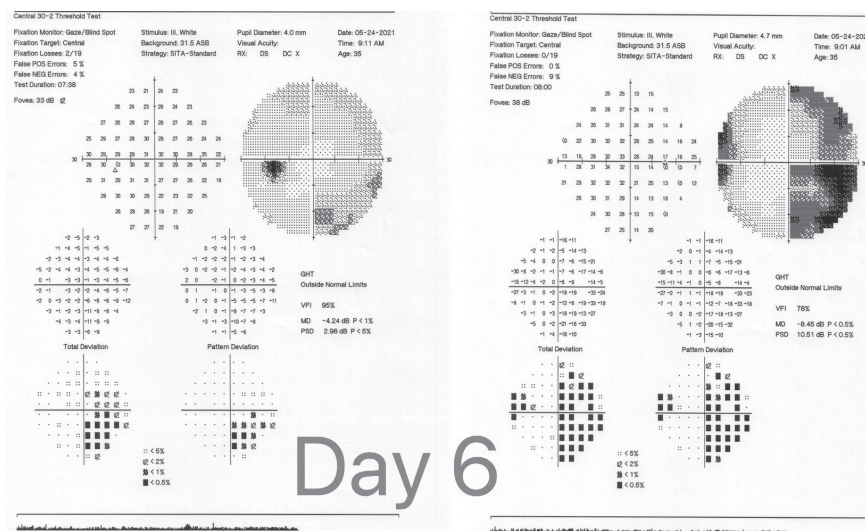


Figure 7 Computerized visual field (CTVF) 30-2 : Day 6

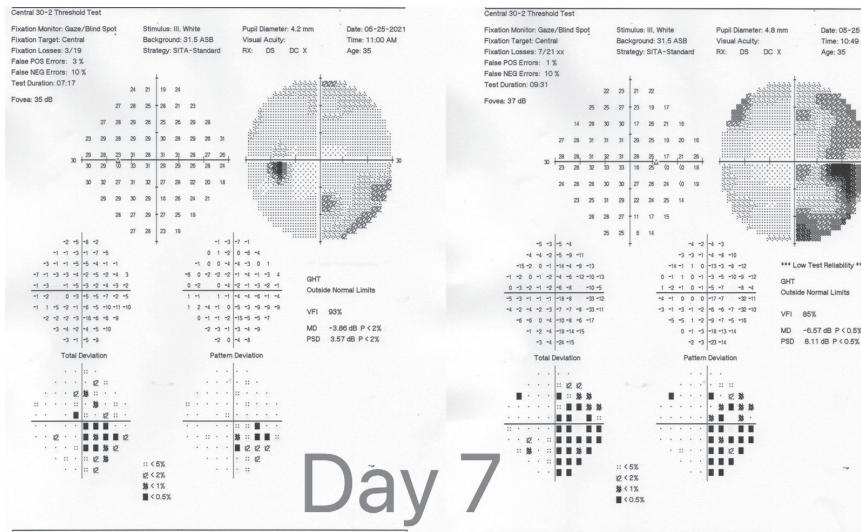


Figure 8 Computerized visual field (CTVF) 30-2 : Day 7

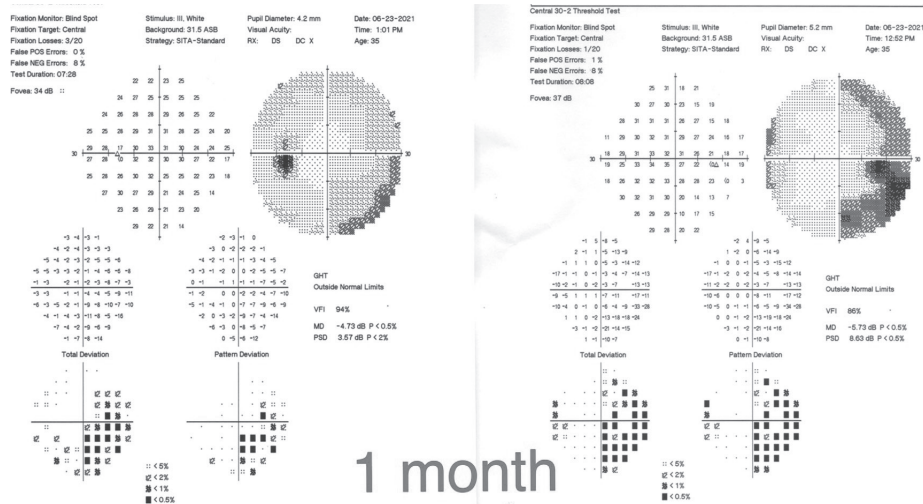


Figure 9 Computerized visual field (CTVF) 30-2 : 1 month

“Right incongruous homonymous hemianopia” is due to left post-chiasmal lesion. The more posterior the cerebral lesion (occipital lobe), the more symmetric (congruous) the homonymous hemianopia will be.<sup>18</sup> In this patient no such pathology was found.

From such events, the exact pathology of the visual field defect in this patient remains unclear due to the following reasons

1) Even though the first injection was uneventful, the visual field defect occurred after received the second dose of vaccine.

2) No risk or pathology was found on any investigation. For example, if the defect is caused by Vasospasm or ISRR, the symptoms will completely resolve within 24 - 72 hours.

3) On the day of vaccination, 159 persons who got the same lot of Vaccine did not suffer any side-effects. Thus, it was unlikely to be associated with abnormal vaccine storage or transportation.

4) If the defect was caused by secondary to the patient’s pre-existing comorbidities, there should be any pathology found on imaging study such as old infarction in brain.

The researchers aim to continue to monitor the CTVF 30-2 and present any significant findings should there be any.

#### **Acknowledgement**

The patients in this manuscript have given written informed consent to the publication of their case details. The author wishes to thank Dr. Pipat Kongsap for data management.

#### **Conflict of interest**

No Conflict of interest

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