

A Comparative Study of CT Features of Raised Intracranial Pressure in Post Covid Patients & General Population

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Abstract

Background & objective:

Headache is a commonly reported complaint among Covid19 patients, and cases of chronic head aching have lately been documented several weeks after illness recovery. Raised intracranial pressure (ICP) plays a key role in the causation of head ache, Raised ICP if not timely treated leads to brain complications. The study aims to compare the incidence of elevated ICP in post-covid populations to that of the general population, and the objective of study is to assess the features of raised intracranial pressure in post covid and in general population by using CT

Method:

Current study was conducted on 150 subjects who have headache symptoms, in which 75 had Covid history and other 75 from general population. The brain CT image of this 150 subjects evaluated to assess ICP And for identifying the comparison between post covid subject with normal subject. This is study done at DR. PSIMS&RF,Gannavaram,AndhraPradesh.CT brain examinations were performed on 16slice SEIMENS CT machine in the department of radiodiagnosis. CT brain images of patients with headache complaints were evaluated.

Results:

CT Brain images of 150 subjects who came with complaints of headache were evaluated.75 patients among them had past covid history, rest 75 were taken as general population group. In the post covid group 32 patients (42%) had raised ICP features&18 patients (24%) in general population had raised ICP features. Bilateral tortuous optic nerve sheaths were found in 34 patients (45%) in post covid group as opposed to 21 patients (28%) in the general population group. Partial empty sella was found in 35 patients (46%) of post covid group as opposed to patients 21(28%)in the

general population group. Patients who had both partial empty sella and bilateral optic nerve sheath dilatation were considered to be of raised ICP to rule out other etiologies.

Key words: Headache, Covid, CT (Computed Tomography), intracranial pressure.

Introduction:

Covid 19 which caused a pandemic though mainly involves the respiratory tract; it has also been seen to have significant effects on CNS both in short term and long term. Covid 19 remains latent in CNS for a long time, being able to reactivate and trigger neurological complications [1]. Post covid aftermath in CNS includes Stroke, Guillain-Barre syndrome, Encephalopathy among others [2]. Head ache is very frequently reported symptom among patients with Covid19 and recently cases of persistent head ache have been reported even weeks after recovery from the disease [3]. This type of head ache has holo cranial pressure like pain. Raised intracranial pressure plays a key role in the causation of head ache. In accordance with the International Classification of Headache Disorders, a headache due to systemic viral infection is diagnosed when there is a relationship between the development of pain and systemic viral infection in the absence of encephalitic or meningitic symptoms [5-8]. According to various clinical series, the incidence of headaches in COVID-19 patients varies from 5 to 34%. The other symptoms of raised ICP include blurred vision, confusion, and hypertension among others [9-12]. The damage to the brain that is induced by cerebral ischemia is the primary contributor to the negative effects of intracranial hypertension. Ischemia of the brain occurs when there is decreased blood flow to the brain as a consequence of elevated intracranial pressure (ICP). The evaluation of elevated ICP should include collecting a comprehensive history, doing a physical exam, and conducting any necessary ancillary investigations [13-15]. In order to avoid herniation and probable death, it is of the utmost importance to detect elevated ICP as early as feasible. The term "CT scan" is frequently used interchangeably with "computed tomography." A computed tomography (CT) scan is a diagnostic imaging method that produces images of the inside of the body by employing a combination of x-rays and computer technology to make the images [16-18]. In the present study We hypothesized raised ICP to be the chief cause of headache in post covid affecting the quality of life. Raised ICP if not timely treated leads to brain complications. With prompt treatment it is possible for people with raised ICP to make full recovery and get relief from symptoms. CT Brain is a very good modality to evaluate for raised ICP in form of dilated and tortuous bilateral optic nerve sheaths, partial empty sella etc. These signs are direct and easy to interpret. CT is cost effective and time effective, hence chosen for the study. The aim of the study is to assess the incidence of raised ICP in post covid population as against the general population. The objective of the study is to assess the features of raised intracranial pressure in post covid and in general population by using CT.

Materials & Methods:

Current study was conducted on 150 subjects who have headache symptoms, in which 75 had Covid history and other 75 from general population. This is study done at DR. PSIMS&RF, Gannavaram, Andhra Pradesh. CT brain examinations were performed on 16slice SEIMENS CT machine in the department of radiodiagnosis. CT brain images of patients with headache complaints were evaluated.

Inclusion Criteria:

Patients presenting with headache for a CT Brain study.

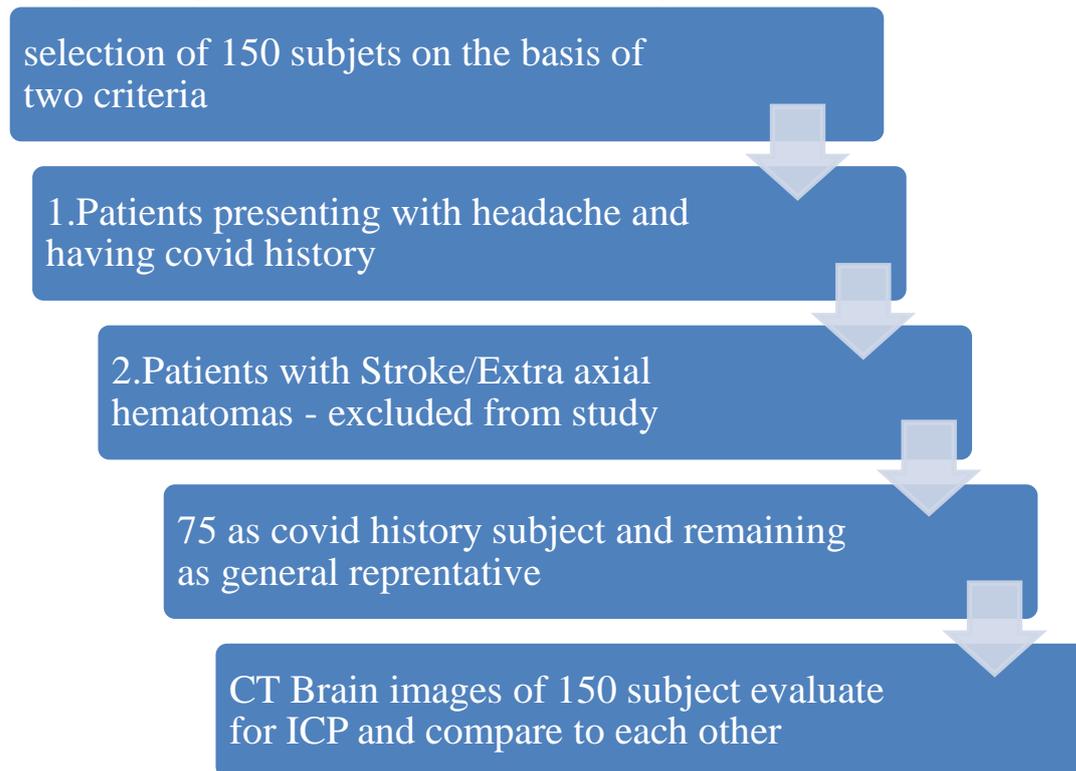


Figure 1: systematic illustration of post covid complications [19,20]

Exclusion Criteria:

Patients with Stroke/Extra axial hematomas/any lesions causing mass effects to prevent con-founding.

Procedure:**Results:**

The CT brain images of 150 subjects who presented with headache complaints were analysed. Of these patients, 75 had a history of COVID, and the remaining 75 were taken as a representative sample of the general population. 32 patients, or 42%, in the post-covid group had raised ICP features, while only 18 patients, or 24%, in the general population had raised ICP features. When compared to the general population group, which had only 21 patients with tortuous optic nerve sheaths, the post-covid group had 34 patients with bilateral optic nerve sheaths that were tortuous. In the post-

COVID group, there were 35 patients (46%) who had a partial empty sella, whereas there were 21 patients (28%) in the general population group who had this condition. In order to rule out other causes, patients who had both a partially empty sella and bilateral optic nerve sheath dilatation were thought to have high intracranial pressure.

Table 1: result summary of raised ICP in post covid and general population

	POST COVID (n=25)	GENERAL POPULATION (n=25)
RAISED ICP	32(42%)	18(24%)
TORTUOUS OPTIC NERVE SHEATHS	34(45%)	21(28%)
PARTIAL EMPTY SELLA	35(46%)	21(28%)

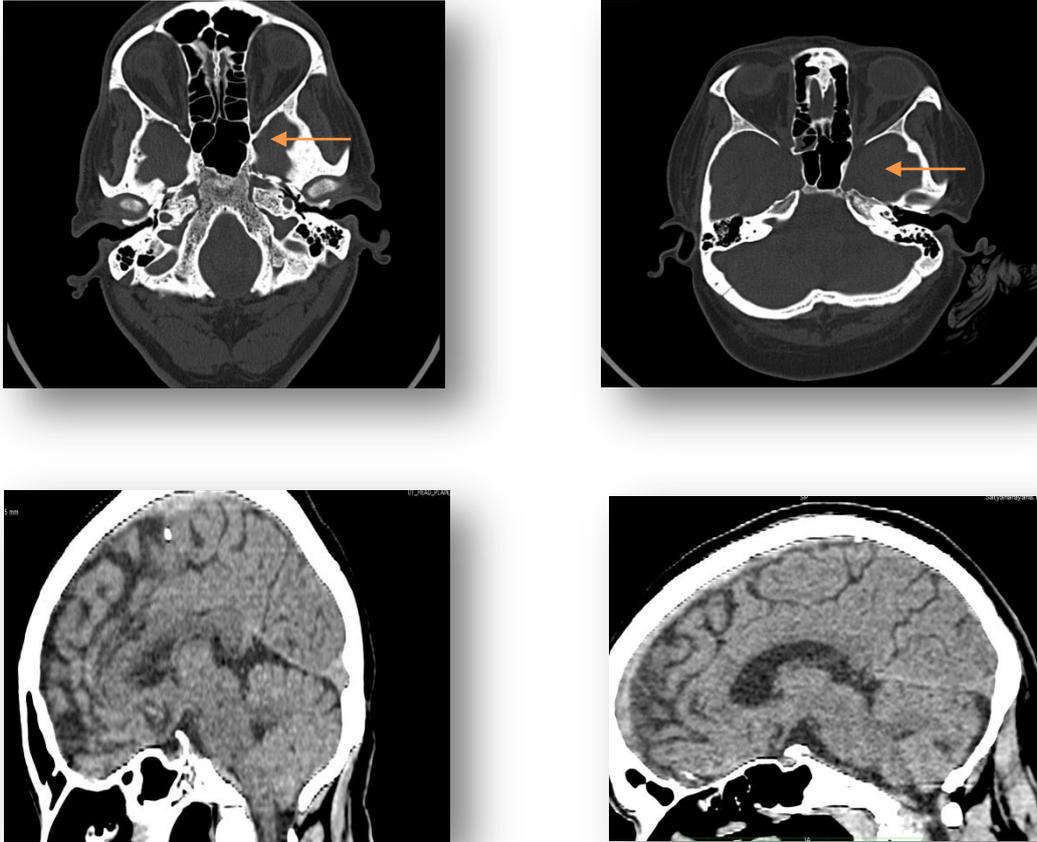


Fig1: CT (Computed tomography) images of brain

Discussion:

A headache is a frequent symptom that has to be evaluated for a wide variety of possible underlying diseases[21]. In the post-covid population, there has been an increasing incidence of headaches[22-23]. It is possible that an elevated intracranial pressure (ICP), which is one of the many main causes of headaches, is to blame, but this is not entirely certain. It is hypothesised that elevated levels of neurofilament light chain(NfL) in the CSF are responsible for the mechanism of increased intracranial pressure . We attempted to determine the relationship between the elevated ICP and the post-covid state. According to our findings, the incidence of elevated ICP was 42% higher in the post-COVID group than it was in the overall population with head discomfort. Therefore, it is abundantly obvious that there is a connection between the post-covid state and an elevated ICP. CT Brain was able to quickly detect the increased ICP by different indicators such as a half empty sella and bilateral twisted optic nerve sheaths, both of which were mentioned above. Without CT Brain, the evaluation would have been inadequate and impossible. It is possible to avoid major problems like stroke, encephalopathy, and Guillain-Barré syndrome by checking for high intracranial pressure in patients who have had headaches after a concussion. Due to the novelty of the virus, there are not many studies that have been conducted on this topic. Hence, additional investigations are required to confirm the association between

post-covid status and elevated ICP levels because this is a current issue of concern.

Conclusion:

When compared to the normal population, post-covid patients have an incidence of elevated intracranial pressure that is noticeably higher than the average. This elevated ICP contributes to CNS problems in post-operative patients, and these issues need to be treated as soon as possible. CT has a high level of sensitivity when it comes to detecting features of elevated intracranial pressure. ICP levels because this is a current issue of concern.

Conflict of Interest: None

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