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**PROSPECTIVE CROSS-SECTIONAL STUDY TO EVALUATE AUTONOMIC  
DYSFUNCTION AND CSF ABNORMALITIES IN PATIENTS DIAGNOSED WITH  
ACUTE NON-TRAUMATIC QUADRIPARESIS/QUADRIPLÉGIA IN A TERTIARY  
CARE HOSPITAL**

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**ABSTRACT**

**Aim:** To evaluate autonomic dysfunction and CSF abnormalities in patients diagnosed with Acute Non-traumatic Quadripareisis/Quadriplegia

**Materials and Methods:** Present study was a prospective cross-sectional type of study was conducted among 40 patients diagnosed with acute onset non traumatic quadriplegia / quadripareisis visited the department of Medicine of Dr. D. Y. Patil Medical College and Hospital Pimpri, Pune. Detailed medical history was taken for all selected patients. They were examined in detail with careful general, systemic and neurologic examination according proforma. Examination was done in a separate examination room to interpret the site of the neurological

lesion through clinical signs and to reach a provisional diagnosis, before subjecting to further biochemical and radiological investigations according to the study design.

**Results:** Mean age of patients in the study population was 43.92±14.36 years. Majority of them (32.5%) were in age group of 51 to 60 years. Of them 65% were males and 35% were females. Majority 60% had onset of quadriparesis more than 5 days, 27.5% had 1 to 5 days and 12.5% had onset <24 hours. Breathlessness was reported in 57.5 % of cases, fever in 52.5 percent, and petechiae/rash in 27.5 %. Majority 25% had GBS. Autonomic dysfunction was seen among 65% of cases. Among them 15% had bradycardia, 42.5% had tachycardia, 105 had orthostatic hypotension, 5% had diaphoresis, 5% had sialorrhea, 32.5% had bladder dysfunction. The most common abnormal CSF findings were cytoalbuminologic dissociation (30%), pleocytosis (12.5%), traumatic (7.5%), and oligoclonal bands (5%).

**Conclusion:** Autonomic dysfunction was seen among 65% of cases. The most common abnormal CSF findings were cytoalbuminologic dissociation followed by pleocytosis, traumatic and oligoclonal bands.

**Keywords:** Quadriparesis, Non-traumatic, Autonomic dysfunction, CSF

## INTRODUCTION

The estimated global spinal cord injury (SCI) incidence is 40 to 80 new cases per million population per year.<sup>1</sup> Non-traumatic SCI is more common in the older age groups, and hence with increased life spans, the incidence of non-traumatic SCI will increase and overtake that of traumatic SCI.<sup>2</sup> Spinal cord injuries usually have devastating consequences such as quadriplegia, paraplegia and severe sensory deficits.

Quadriparesis is a typical neurological symptom that develops over days to weeks. An ascending paresis usually begins in the lower limbs and progresses through the trunk and upper limb muscles, weakening the

respiratory bulbar ocular muscles. Descending weakness that progresses in the opposite way is possible, though very uncommon.

The history, an adequate neurological examination and the study of the cerebrospinal fluid (CSF) guide the diagnosis of spinal cord injuries. However, imaging is of great importance in order to home in on the diagnosis and classify the etiology appropriately.<sup>3,4</sup> Present study is aimed to evaluate autonomic dysfunction and CSF abnormalities in patients diagnosed with Acute Non-traumatic Quadriparesis/Quadriplegia in a Tertiary Care Hospital.

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## MATERIALS AND METHODS

Present study was a prospective cross-sectional type of study was conducted among 40 patients diagnosed with acute onset non traumatic quadriplegia / quadriparesis visited the department of Medicine of Dr. D. Y. Patil Medical College and Hospital Pimpri, Pune, after approval from the Ethical Committee of the Institute.

### Inclusion criteria:

- Age > 12 years, Male and Female
- Patients with history of acute quadriparesis /quadriplegia with onset of symptoms less than 4 weeks
- Willing to participate

### Exclusion criteria:

- Age < 12 years
- History of trauma
- History of more than 4 weeks of quadriplegia/ quadriparesis
- Pregnancy
- Not willing to participate

### Data collection

The participants/guardians signed a written informed consent form. The study included patients who presented to the Medicine Department and met the inclusion criteria. Standard questions about clinical profile, addictions, comorbidities, background and family history, socio demographic

characteristics, and so on were asked as part of a pre- designed questionnaire programme. Questions about past and current medical history, as well as health-seeking behaviour, were also included in the questionnaire.

### Methodology

Detailed medical history was taken for all selected patients. They were examined in detail with careful general, systemic and neurologic examination according proforma. Examination was done in a separate examination room to interpret the site of the neurological lesion through clinical signs and to reach a provisional diagnosis, before subjecting to further biochemical and radiological investigations according to the study design.

### Data analysis:

All data was collected and compiled in Microsoft excel. All statistical analyses were performed by using IBM SPSS statistics Version 21.0 (SPSS Inc., Chicago, IL, USA) and openepi version 2.3.1. Descriptive statistics such as percentage (%), mean, range and standard deviation (SD) were used to describe the data. Chi square test was applied for qualitative data and student t test for quantitative type of data. A p value of <0.05 was regarded as statistically significant.

## RESULTS

Mean age of patients in the study population was 43.92±14.36 years. Majority of them (32.5%) were in age group of 51 to 60 years. Of them 65% were males and 35% were females (Table 1).

Majority 60% had onset of quadriparesis more than 5 days, 27.5% had 1 to 5 days and 12.5% had onset <24 hours (Table 2).

Breathlessness was reported in 57.5 % of cases, fever in 52.5 percent, and petechiae/rash in 27.5 % (Table 3).

Autonomic dysfunction was seen among 65% of cases. Among them 15% had bradycardia, 42.5% had tachycardia, 10% had orthostatic hypotension, 5% had diaphoresis, 5% had sialorrhoea, 32.5% had bladder dysfunction (Table 4).

The most common abnormal CSF findings were cytoalbuminologic dissociation (30%), pleocytosis (12.5%), traumatic (7.5%), and oligoclonal bands (5%) (Table 5).

Table 1: Age and gender distribution

Age in years	No. of cases	Percentage
12 to 20	2	5%
21 to 30	8	15%
31 to 40	6	15%
41 to 50	8	20%
51 to 60	9	32.5%
>60	7	12.5%
Mean±SD	43.92±14.36 years.	
Gender		
Male	26	65%
Female	14	35%
Total	40	100%

Table 2: Onset of quadriparesis

Onset of quadriparesis	No. of cases	Percentage
<24 hours	5	12.5%
1 to 5 days	11	27.5%
> 5 days	24	60%
Total	40	100%

Table 3: Clinical features in quadriparesis/quadriplegia

Symptoms	Cases	Percentage
Breathlessness	23	57.5%
Fever	21	52.5%
Petechiae/Rash	11	27.5%

Table 4: Autonomic dysfunction present in the Cases

Signs	No of cases	Percentage
Bradycardia	6	15%
Tachycardia	17	42.5%
Orthostatic hypotension	4	10%
Diaphoresis	2	5%
Sialorrhoea	2	5%
Bladder dysfunction	13	32.5%

Table 5: Abnormal CSF examination findings in the Study Population

CSF	No of cases	Percentage
Cyto-albuminologic dissociation	12	30%
Pleocytosis	5	12.5%
Traumatic	3	7.5%
Cob-web formation	0	0
Oligoclonal bands	2	5%

## DISCUSSION

Mean age of patients in the study population was 43.92±14.36 years. Majority of them (32.5%) were in age group of 51 to 60 years. Of them 65% were males and 35% were females. Study by Chaurasia *et al.* showed that mean age was 43.3±11.1 years. 53.3% were male and 46.67% were females in a similar study on Acute Quadriplegia.<sup>5</sup> Grassner L *et al.* showed that mean age was 61±17 years and 50% were males in a similar study.<sup>6</sup>

Majority 60% had onset of quadriplegia more than 5 days, 27.5% had 1 to 5 days and 12.5% had onset <24 hours. Grassner L *et al.*, showed that 49.5% had rapidly progressing paresis.<sup>6</sup>

Breathlessness was reported in 57.5 % of cases, fever in 52.5 percent, and petechiae/rash in 27.5 %. According to Owolabi *et al.*, radicular discomfort was present in 50% of patients, while paresthesia was prevalent in 38.4%. Around 70% had subjective sensory symptoms, with 22 (36.1%) having limb pain, 13 (21.3%) having limb paresthesia, 5 (8.2%) having backache,

and 3 (5.9%) having both limb and back discomfort.<sup>7</sup>

Autonomic dysfunction was seen among 65% of cases. Among them 15% had bradycardia, 42.5% had tachycardia, 10% had orthostatic hypotension, 5% had diaphoresis, 5% had sialorrhea, 32.5% had bladder dysfunction. Study by Kahloon *et al* showed that more than 90% of cases presented with paraparesis and bladder dysfunction.<sup>8</sup> Bhargava A *et al* (72) showed that autonomic dysfunction was seen in 27 (44.3%) patients which included tachycardia (10), constipation (7), bradycardia (4), excessive sweating (2) and hypertension (2). Bladder involvement was seen in 9 (14.8%) patients.<sup>9</sup>

The most common abnormal CSF findings were cytoalbuminologic dissociation (30%), pleocytosis (12.5%), traumatic (7.5%), and oligoclonal bands (5%). Increased protein in the CSF is a supportive element of chronic inflammatory demyelinating polyneuropathy, according to a study by Illes Z *et al* in the lack of definitive electrophysiologic criteria.<sup>10</sup> Similar to GBS, a variety of additional indicators have been studied in the CSF of individuals with chronic

inflammatory neuropathies. Cerebrospinal fluid examination revealed albumin cytological separation in 49 (80%) individuals, with protein levels ranging from 48 to 242 mg/dl, according to Bhargava A *et al.*<sup>9</sup>

## CONCLUSION

The present study concluded that the most common cause of non-traumatic quadriplegia was Guillain Barre Syndrome. Autonomic dysfunction was seen among 65% of cases. The most common abnormal CSF findings were cytoalbuminologic dissociation followed by pleocytosis, traumatic and oligoclonal bands.

## REFERENCES

- [1] New PW, Cripps RA, Bonne Lee B. Global maps of non-traumatic spinal cord injury epidemiology: towards a living data repository. *Spinal Cord*. 2014 Feb;52(2):97-109.
- [2] New PW, Farry A, Baxter D, Noonan VK. Prevalence of non-traumatic spinal cord injury in Victoria, Australia. *Spinal Cord*. 2013 Feb;51(2):99-102.
- [3] Hauser SL. Diseases of the spinal cord. En: *Harrison's principles of internal medicine*. 16th ed. New York: McGraw-Hill; 2005. p. 2438-47.
- [4] García DR. Mielopatías. Manual de Prácticas Médicas-Hospital Hermanos Ameijeiras [internet]. 2008 [cited on 20 June 2021]. Available at [http://www.sld.cu/galerias/pdf/sitios/neurologia/pa\\_mielopatias.pdf](http://www.sld.cu/galerias/pdf/sitios/neurologia/pa_mielopatias.pdf).
- [5] Chaurasia RN, Verma A, Joshi D, Misra S. Etiological spectrum of non-traumatic myelopathies: experience from a tertiary care centre. *The Journal of the Association of Physicians of India*. 2006;54:445-8.
- [6] Grassner L, Marschallinger J, Dünser MW, *et al*. Nontraumatic spinal cord injury at the neurological intensive care unit: spectrum, causes of admission and predictors of mortality. *Ther Adv Neurol Disord*. 2016;9(2):85-94.
- [7] Owolabi LF, Ibrahim A, Samaila AA. Profile and outcome of nontraumatic paraplegia in Kano, northwestern Nigeria. *Annals of African medicine*. 2011;10(2):86-90.

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- [8] Kahloon AA, Arif H, Baig SM, Khawaja MR. Characteristics of acute transversemyelitis at Aga Khan University Hospital, Karachi. *JPMATh eJournal of the Pakistan Medical Association*. 2007;57(4):215-8.
- [9] 72. Bhargava A, Banakar BF, Pujar GS, Khichar S. A study of Guillain-Barré syndrome with reference to cranial neuropathy and its prognostic implication. *J Neurosci Rural Pract*. 2014;5(Suppl 1):S43-S47.
- [10] Illes Z, Blaabjerg M. Cerebrospinal fluid findings in Guillain-Barré syndrome and chronic inflammatory demyelinating polyneuropathies. *Handb Clin Neurol*. 2017;146:125-138.