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A Study on Etiological Profile of Non-Compressive Myelopathies in a Tertiary Care Hospital in South Kerala

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ABSTRACT-
Background:
Non compressive myelopathies are common in clinical practice.Systematic approach in management is required in detecting etiologies and managing them.
Objective: It was a Retrospective study based on review from hospital database of non-compressive myelopathy patients admitted at a tertiary hospital in kerala from October 2015 to September 2020 and appropriate statistical analysis done. Ethical clearance obtained prior to study.
The aim of the study was to determine the etiology of non-compressive myelopathy patients admitted and their presentations and outcome.Patients presenting with acute to subacute,chronic myelopathy were assessed by history, clinical examination and magnetic resonance imaging of spine and brain with contrast.
In addition routine blood tests, visual evoked potentials, cerebrospinal fluid analysis, immunological, infectious, and metabolic profile done .
Results:In our study a total of 113 patients were treated whose details were collected from hospital database and were analysed statistically and outcome were assessed.Acute to subacute myelopathies were seen in 92 patients and rest were of chronic illness (21 patients). Acute transverse myelitis was the common cause.Males were affected more and the common age group were in the middle age. Patients had varied presentations of which paraparesis was common.On follow up, 36 patients had residual deficits (31.8%) .17.4% patients of acute/subacute myelopathy, 95.4% of chronic myelopathy patients had residual defecits.Residual deficits included spasticity,paraparesis ,autonomic complaints.
Conclusion: Non compressive myelopathy affected patients across all age groups but commonly seen in middle age group. Infectious etiology were common and had better prognosis.Post myelopathy residual weakness were common in chronic cases,lesser in acute to subacute group.Early identification and timely management had better outcome .
Key Words- Noncompressive myelopathies,Etiology ,outcome.

I. INTRODUCTION-

Myelopathy refers to spinal cord pathologies.Compressive and non-compressive myelopathies in neurological clinics are common[1].Clinico-radiological evidence is required to differentiate compressivefrom non-compressive myelopathy[2,3]. Myelopathy mimics are common in early stage like guillain barre syndrome.periodic paralysis, which can mimic spinal pathology in early stage.Proper history with detailed clinical examination distinguishes it from others.Specific findings favoring myelopathy are sensory level,spinal tract crossed findings,spinal tract specific sensory findings,urinary retention are some.Compressive myelopathies are managed by neurosurgical intervention whereas non compressive medically.Prognosis of most of the non-compressive myelopathies depends on early management and rehabilitation.Etiology and management of non-compressive myelopathy requires a comprehensive systematic approach with clinical, radiological with appropriate blood examination and CSF study.[3,4]

Some commonly encountered causes in clinical practice are demyelination, infection, metabolic disorders, ischemic causes , autoimmune,paraneoplastic, toxic, radiation exposure[4,5]

II. MATERIAL AND METHODS-

It was a Retrospective study based on review from hospital database of non-compressive myelopathy patients admitted at our hospital(Travancore medical college hospital) from October 2015 to September 2020 and appropriate statistical analysis done.Ethical clearance obtained prior to study.

The aim of the study was to determine the etiology of non-compressive myelopathy patients admitted and their presentations and outcome.

Patients presenting with acute to subacute,chronic myelopathyassessed by history, clinical examination were subjected to magnetic resonance imaging of spine and brain with contrast.

Patients with compressive etiology were excluded.Patients were then subjected to detailed history regarding onset of illness,duration and progression.Associated symptoms like fever, visual loss, history relevant to connective tissue diseases (rash,polyarthralgia/arthritis,scleritis,joint deformities,oral ulcer),history of sexual transmitted disease (genital ulcer, skin rash,weight loss, oral ulcer) ,history of recent vaccination, exposure to toxins(organo phosphorous compound),radiation exposure,mal absorption features(chronic diarrhea,weight loss,anemia),history regarding similar illness in the past or among family members were asked.

Patients were then subjected to blood investigations (complete blood count,renal function test,liver function test,serum Vitamin B12 assay,Serum ANA, HIV,HTLV,Hbsag, HCV,serum VDRL, serum NMO antibody and MOG antibody), CSF examination (sugar,protein,cell count,cell type,oligo clonal bands,ADA),visual evoked potentials,nerve conduction study,chest XRAY, Ultrasoundabdomen. Special tests done depending on suspecting etology like serum auto immune profile,serum ACE levels,serum paraneoplastic panel of antibody,serum copper.

III. RESULTS-

Patients included in the study group were classified based on onset of illness and etiology.Acute and subacute myelopathy includes onset within 3 weeks and this group of patients are commonly seen in casualty .chronic myelopathy patients are those whose symptoms varies from months to years.

In our study a total of 113 patients were included whose details were collected from hospital database and were analysed statistically and outcome were assessed.Acute to subacute myelopathies were seen in 92 patients and rest were of chronic illness (21 patients). Acute transverse myelitis was the common cause.Males were affected more and the common age group were in the middle age.

Etiology of Non compressive myelopathy patients.

Myelopathy -Etiology	Number of patients (N-113)
Acute Transverse myelitis	24 (21.2%)
ADEM	17 (15.1%)
Multiple sclerosis	11 (9.7%)
Neuro myelitis optica(NMO)	5 (4.4%)
NMO spectrum disorders	8 (7.2%)
MOG antibody myelitis	1 (0.9%)
VITAMIN B12 deficiency myelopathy	12 (10.6%)
Spinal cord infarction	6 (5.3%)
Radiation myelopathy	6 (5.3%)
Toxic-OP compound poisoning	1 (0.9%)
Hereditary spastic paraparesis	4 (3.5%)
Paraneoplastic myelopathy	3 (2.7%)
Connective tissue disease associated myelopathy	4 (3.5%)
Idiopathic/unknown	11 (9.7%)

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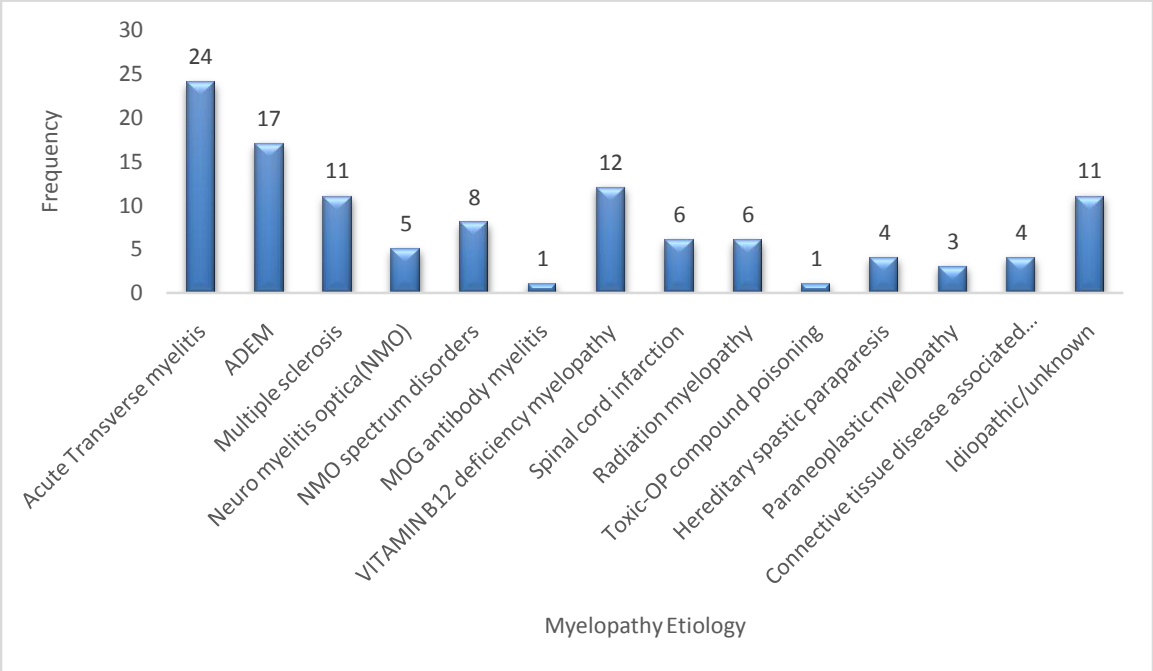

Age distribution of patients

Age group	Number of patients (n=113)	Percentage
0-10	5	4.4
11-20	15	13.3
21-30	28	24.8
31-40	25	22.1
41-50	12	10.6
51-60	19	16.8
>60	9	8.0

Sex distribution of patients

Sex	Number of patients (n=113)	Percentage
Male	81	71.7
Female	32	28.3

Clinical features of patients

Clinical features	Number of patients (n=113)	Percentage
Quadriparesis	18	15.9
Paraparesis	95	84.1
Posterior column sensory loss	55	48.7
Spinothalamic sensory loss	61	54.0
Spincter involvement	82	72.6
Flexor spasms	15	13.3
Optic neuritis	13	11.5

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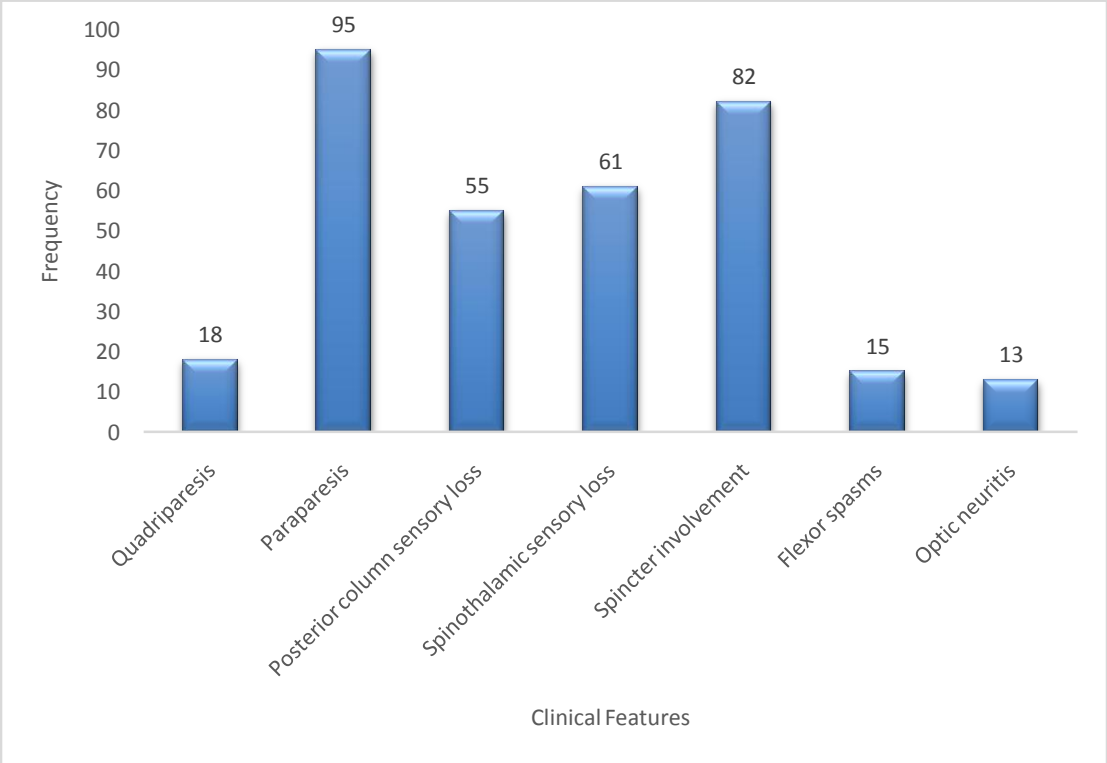

Patients with residual weakness and disability based on onset

Onset of myelopathy	Residual deficits	Percentage
Acute to subacute (n=92)	16	17.4
Chronic (n=21)	20	95.2

IV. DISCUSSION-

Non compressive Myelopathy is common in neurology practice and the importance of early recognition and management results in better outcome as per our observation.Physicians treating myelopathy should be well trained for their systematic approach,as some of the chronic patients had delayed medicalattention.Systematic method of evaluation helps in early diagnosis of etiology and appropriate management.[6]

International standard guidelines were adopted in diagnosing etiology in our study. Some of which are as follows

1. Revised MC Donalds criteria (2010) for diagnosis of multiple sclerosis.[7]
2. 2015 International Panel for NMO Diagnosis criteria-(Wingerchuk criteria) for diagnosis of neuromyelitis optica[8]
3. Parainfectious myelitis and post infectious is caused secondary to immune response to infection within one month,and usually secondary to viral illness like herpes simplex,Epstein barr virus, entero virus.Also seen secondary to Tuberculosis,bacterial,spirochetal and fungal infection although rare.[9]
4. Acute disseminated encephalomyelitis (ADEM) is monophasic myelitis secondary to infection[9,10] usually viral or vaccination and are common in children.Relapse is rare and if so alternative diagnosis to be considered.Patient present with multifocal features secondary to cortical, subcortical and spinal cord involvement like decreased sensorium,seizures,bilateral optic neuritis,myelitis.The spinal cord is affected in 11% to 28% of patients, generally in the thoracic and cervical segments.

A study in north east India in 2017 by Ashok Kumar Kayaletal[10]had 151 patients (96 Acute/ subacute myelopathy-ASM and 55 chronic myelopathy-CSM) with a median age of 35 years and male: female ratio 1.4:1. The causes of ASM were neuromyelitis optica spectrum disorder (23), multiple sclerosis (MS) (8), systemic lupus erythematosus (1), Hashimoto's disease (1), postinfectious acute disseminated encephalomyelitis (6), postinfectious myelitis (8),

infections (9), spinal cord infarct (5), and electrocution (1). The causes of CM were MS (1), probable or possible sarcoidosis (7), mixed connective tissue disease (1), Hashimoto's disease (2), infections (9), Vitamin B12 deficiency (4), folate deficiency (2), hepatic myelopathy (2), radiation (11), and paraneoplastic (1). No etiology could be found in 48 (31.8%) patients (34 ASM and 14 CM). In 21/96 (21.9%) patients of ASM, acute transverse myelitis was idiopathic based on current diagnostic criteria. Underlying etiology (demyelinating, autoimmune, infectious, vascular, metabolic disorder, or physical agent) was found in 68% patients of non-compressive myelopathy.

In our study,acute /subacute myelopathy patients contributed to 82% patients,of which acute transverse myelitis was the most common etiology.ATM(acute transverse myelitis) contributed to 21.2% of patients.Demeyelination secondary to ADEM,multiple sclerosis, NMO spectrum disorders were also common.As these patients presented early in their course of illness,had better outcome. Thay were managed with steroids/IVIG/plasmapharesis.

Vitamin B12 deficiency associated sub acute combined degeneration were observed in 10.6% and had good outcome.

Chronic myelopathy patients contributed to 18.5%. chronic myelopathy patients had poor prognosis on recovery .Etiology were radiation/toxic exposure ,neurodegenerative illness, paraneoplastic cause.

9.7% patients of myelopathy were of had unknown cause and all presented with were of acute/sub acute myelopathic pattern.

Myelopathy patients had varied presentations of which paraparesis was common seen in 84%.. On follow up,36 patients had residual deficits(31.8%) of which 17.4% patients were of acute/subacute myelopathy and major part were of chronic myelopathy contributing 95.4%. Residual deficits included spasticity, paraparesis ,autonomic complaints.

V. CONCLUSIONS-

In our study non compressive myelopathies affected people across all age groups, but commonly seen in middle age group. Infectious etiology were common and had better prognosis.

Post myelopathy residual weakness were common in chronic cases,lesser in acute to subacute group.Early identification and timely appropriate management had better outcome.Follow up of these patients were required to analyse their relapse.

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LEGENDS

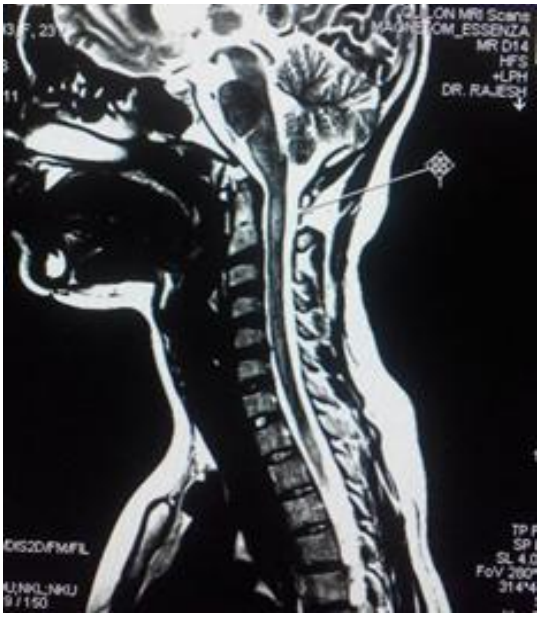

Figure 1- MRI of patient with quadriparesis-T2 hyperintensities in cervical cord(longitudinal extensive myelitis) –suggestive of demyelination-acute disseminated encephalaomyelitis.