

Presentations and Treatment of Multiple Sclerosis in Pakistan: A Retrospective Review of 188 Cases

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Approximately 10 out of every 100,000 people in Pakistan have multiple sclerosis (MS), yet there is a dearth of research on MS in the country, with most prior studies limited by small sample sizes. We wish to report on the largest study of MS patients from Pakistan. The objectives of this study were to identify demographic characteristics, disease characteristics, hospitalization causes, and past and current treatments of patients with MS in Pakistan. A retrospective review of patient records of all patients diagnosed with MS was carried out at the Department of Medicine at the Aga Khan University Hospital in Karachi and the Pakistan Institute of Medical Sciences in Islamabad. Medical records were used to generate a list of patients who were admitted at participating centers with a diagnosis of MS between December 2019 and September 2020. The diagnosis of MS was based on McDonald criteria. The study was approved by the ethics review committees of both participating centers.

The study included 188 patients (mean age, 31.1 ± 11.22 years), with 37.2% men and 62.8% women. Relapsing-remitting MS was the most common type (81%), followed by primary progressive (10%) and secondary progressive (9%). The most common finding on T2-weighted fluid-attenuated inversion recovery MRI sequences was the presence of multiple foci (69.2%), most seen in the periventricular region (52.1%), followed by the juxtacortical region (49.3%). A single focus of gadolinium enhancement was observed in 20% of patients, most seen in the spinal cord (23.9%), followed by the periventricular area (18.1%).

Medication infusion was the most common reason for hospitalization, reported in 16% of cases, followed by exacerbation of MS in 13.8% cases, and infection in 4.3% cases. Ocrelizumab (5.3%), steroids (3.8%), and rituximab (3.2%) were the most common treatments prescribed. Patients had been treated previously with oral and intravenous steroids, azathioprine, and mitoxantrone, as shown in **TABLE 1**.

A detailed study of MRI lesions found multiple foci to be the most prevalent (69.2%), with periventricular and juxtacortical lesions the most common sites (52.1% and 49.3%, respectively). Incidental MS was reported in less than 1% of MRI scans.¹ Disease characteristics and MRI findings in our group of MS patients were consistent with publications from other

TABLE 1. Current and Previous Treatment Received by Patients With MS

Treatment	Currently taking, n (%)	Previously received, n (%)
IV methylprednisolone	5 (2.7)	93 (49.5)
Monthly steroid injections	—	16 (8.5)
PO steroids	2 (1.1)	93 (49.5)
Mitoxantrone	1 (0.5)	30 (16.0)
Interferon beta-1a	2 (1.1)	13 (6.9)
Interferon beta-1b	—	8 (4.3)
Methotrexate	—	4 (2.1)
Azathioprine	2 (1.1)	51 (27.1)
Leflunomide	—	2 (1.1)
Ocrelizumab	10 (5.3)	—
Alemtuzumab	—	2 (1.1)
Fingolimod	—	2 (1.1)
Rituximab	6 (3.2)	3 (1.6)
Plasmapheresis	—	3 (1.6)
IV immunoglobulins	—	1 (0.5)
Other	6 (3.2)	—

IV, intravenous; MS, multiple sclerosis; PO, by mouth.

parts of the world.² We explored reasons for hospitalization, the most common of which were MS exacerbation and medication infusions. Most patients (83%) were not taking any medications at their most recent evaluation. A prior study stated that 95% of patients received pulse steroids.^{3,4} Other treatments mentioned in literature include interferon beta, methotrexate, mitoxantrone,^{4,5} ocrelizumab, teriflunomide, alemtuzumab, and, per informal reports from neurologists, rituximab and azathioprine.³ Wasay et al found that less than one-fourth of all patients received disease-modifying therapies, of which 11% received methotrexate, 10% received mitoxantrone, and 1% received interferon beta therapy.⁴ However, recent years have seen a rise in the use of disease-modifying therapies due to an aggressive disease course or secondary progressive MS.⁶

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