Multiple Sclerosis in India

This issue of AIAN has many articles on multiple sclerosis (MS), so I thought of reviewing article published on MS from India. Older belief that MS is rare in India to present setting of suspecting MS in every correct case scenario has been shown by increasing number of publications from India. This article has tried to review publication on MS from Indian authors.

Since the first publication of 6 cases by Singh and Gupta,[1] there has been increasing number of publication from India, due to improving diagnostic facility including pathologically cases by Dastur and Singhal.[2]

Singhal and Wadia, described 30 cases of MS and neuromyelitis optica (NMO), observed over 15 years breaking the myth that MS is uncommon in India.[3] Chopra *et al*. reported 54 patients with MS from Northwest India with 2 pathologically proven cases and 5 cases with Devic's disease.[4] This study reported more common occurrence of optic neuritis (ON), myelopathy, and higher incidence of classical neuromyelitis optica (NMO). Wadia and Bhatia reported MS in Parsi population with a crude prevalence ratio of 26–58/100,000 from Mumbai/Pune=(age-adjusted prevalence ratio for Mumbai was 24/100,000, with 95% confidence limits of 13.1–40.3, which is same as the rest of the world.[5,6] Trikannad *et al*.[7] reported HLA-B12 in Parsi and non-Parsi Indians. Chand and Devi showed the utility of blink reflex and somatosensory-evoked potential in predicting conversion of ON to clinically suspect MS.[8] Jain and Maheshwari complied data of largest case series of 354 cases of MS published from India over the previous three decades and again confirmed higher incidence of ON and NMO.[9] The study also reported that MS might be more common in northern part of India as compared to south based on this data. Singhal[10] reported approximate prevalence rate of 0.17–1.33/100,000 of population in different parts of India based on hospital data record (105 cases of clinical data management systems [CDMS] and 14 cases of NMO from Mumbai region, 1957–1983). The study reported that MS in India is more like other Asian countries as compared to the West with higher incidence of NMO (6%). Common MS was opticospinal form of MS (71.4%) but lesser of cerebellar involvement in the higher socioeconomic group.

Bansil *et al*. compared the population of India and USA in a case–control study and concluded that involvement of the cerebral hemispheres, cerebellum, spinal cord and brainstem were same including disease progression while ON was more frequent in Indian patients. There were no familial cases.[11] In another publication, Bansil *et al*. looked at environmental risk factors in Indian patients and reported no difference in prior foreign travel, surgeries, blood transfusions, clinical chicken pox and mumps infections and exposure to cats/farm animals as risk factors. There was more exposure to clinical measles infection and dog exposure in the MS patients.[12]

Singh *et al*. studied differences in imaging of MS and acute disseminated encephalomyelitis (ADEM). The study included 33 patients with 14 as CDMS and 19 as ADEM.[13] Banerjee *et al*. first reported pediatric MS.[14] Chopra *et al*. (2002) evaluated cerebrospinal fluid (CSF) beta-1-globulin in MS and ADEM. It was significantly higher in ADEM ($P < 0.05$). The negative predictive value (>6.5%) was 100% for diagnosing MS helping in differentiating between MS and ADEM patients. Sahota *et al*. evaluated the utility of transcranial magnetic stimulation (TMS) as diagnostic utility in MS.[15] The study found TMS to be very useful tool in detecting corticospinal conduction abnormalities in MS that may have no clinical correlate and in monitoring the course of the disease.

Narayan *et al*. reported MS in Keralite migrated to Middle East in two siblings.[16] At this time, familial MS was not reported from India.

Pandit wrote about the experience of mitoxantrone (MTX) in MS.[17] Singhal *et al*. same year reported his experience of MTX in 23 patients with MS/NMO and concluded that benefit persisted 2.5 years after completion of therapy with 15% developing neutropenia and 2 patients cardiotoxicity and required discontinuation of MTX. Gupta *et al*. reported the first experience of beta-interferon in 16 patients.[18]

Santra and Ray reported the first case of Marburg's variant of MS.[19] Dudani *et al*. studied the relation of Vitamin D and MS and reported that higher Vitamin D level had lower risk of MS.[20] Pandit *et al.* also had similar observations.[21]

Pandit *et al*. failed to show any relation between Epstein–Barr virus infection with MS in the study of 140 patients with MS.[22] Patil *et al*. evaluated the effect of yoga on neurogenic bladder in MS and concluded that doing 2 hours of yoga (various practices) for 21 days improved neurogenic bladder.[23] Nagraj *et al*. in a case–control study evaluated fatigue in patients with MS and concluded that severe fatigue was significantly more in patients with MS as compared to control[24] and it was also found to be associated with depression and sleep disturbance[25] which was also reported later by Chennadurai *et al*.[26]

Saxena *et al*. evaluated retinal nerve fiber layer (RNFL) thinning in MS and found reduced thickness of RNFL which also correlated to visual symptoms[27] and later his group also reported that ganglion cell layer + ganglion cell-inner plexiform layer thickness is a more sensitive clinical structural marker than RNFL in early MS with/without ON.[28]

Jena *et al*. evaluated the natural study of MS in 157 patients and concluded that there is higher incidence of opticospinal onset,

higher cases of relapsing–remitting MS (RRMS) and poor utility of CSF study.[29] Pandit *et al*. evaluated 109 European-associated variants in a total of 270 patients with MS and 555 controls and showed that two-third of variants overlapped suggesting similarity in etiology irrespective of ethnicity[30] as well as human leukocyte antigen (HLA) (DRB1 × 15:01 and DRB1 × 03 alleles) similarity[31] and also showed CD6 gene polymorphism rs17824933 as seen in European population.[32] Zahoor *et al*. evaluated Ile587Val polymorphism of the EIF2B5 gene in MS in Kashmir and did not find any polymorphism[33] and also reported the clinical profile of 14 patients of MS from Kashmir.[34]

Pandit *et al*. reported the usefulness of mycophenolate mofetil in 40 patients with MS used for 2 years. Singhal *et al*. reported clinical details of 105 patients (68.4% RRMS, 16.8% secondary progressive MS, and 14.8% PPMS) with MS from northern tertiary center with mean disease duration of 6 years, mean expanded disability status scale at presentation of 3.2 and found similarity between published data from western countries.[35] Malli *et al*. evaluated the risk factors for MS (139 MD and 278 control) and concluded with measles ($P < 0.007$), vegetarian diet ($P < 0.001$, higher educational status ($P < 0.0001$) and urban living ($P < 0.0001$) as risk factors while *Helicobacter pylori* infection *(*$P < 0.001$) was protective.[36] A study by Chinnadurai *et al*. suggested cognitive fatigue in patients with MS.[37] Chinnadurai *et al*. interestingly showed that P13, N10, and P37 latencies strongly predicted falls in patients with MS (134 patient with MS).[38]

Looking at the published literature on MS from India, suggests that there were no have been no studies with , basic science research work which is of groundbreaking research, path changing, or novel ideas. So this , which must stimulates younger researchers to look into the available literature and plan their research work beyond that rather than repeating same in Indian population or just looking for new mutation in India patients. I presume this article might stimulate few researchers to work toward new fields of research in MS.

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