

ARE INFECTIONS KEY ENVIRONMENTAL FACTOR IN MS? CON VIEW

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Multiple Sclerosis (MS) is a chronic neurological disorder, which ranks second to trauma, as a cause of disability among young people in the western world. The cause of MS is unknown. A hypothetical autoimmune model of pathogenesis has been assumed based on superficial resemblance of the disease with acute disseminated encephalomyelitis (ADEM) and its animal model, experimental allergic encephalomyelitis (EAE). There is little evidence that treatment paradigms based on an autoimmune pathogenesis of MS has delivered long-term tangible benefit to patients over the years, although it has been associated with treatment-related fatalities and serious complications.

Infection and immunisation are two major environmental risks for ADEM. However, infection does not appear to be a key risk factor in MS which is postulated to be a metabolically dependent neurodegenerative disorder¹. It is essential to look beyond autoimmunity to grasp the key risk factors in MS and develop effective strategies to prevent the disease².

It is acknowledged from twin studies that genetic role in MS is at best low and the major risk is environmental. The best proof of low genetic susceptibility is the substantially higher incidence of the disease seen among second generation African and Asian population born to parents migrating to the northern European countries. A legitimate environmental risk factor for MS must, therefore, explain the following key epidemiological features of the disease:

- geographic prevalence with a striking latitudinal gradient in both northern and southern hemispheres
- significantly higher prevalence in women (F: M currently approaching 3:1)
- risk of the disease (and the reversal of risk) associated with population migration before the late teenage years
- relatively slower disease progression in cases acquired in paediatric life
- season of birth effect suggesting a prenatally acquired risk of the disease in utero
- non-transmissibility of the disease

There is no single infectious agent which can meet these requirements. Epstein Barr Virus (EBV) is probably the only infectious agent which comes somewhere close to meet these requirements, but fails as the primary environmental factor because of two reasons: EBV infection alone does not explain the reduction in the risk of the disease among migrants from high to low prevalence areas; second, it cannot explain the observation that the risk of MS during the ages of 6-15 years is inversely related to solar exposure (ultraviolet radiation)³. EBV infection is also unlikely to be the cause of paediatric onset MS between the age of 5-12 years⁴. Non-EBV infections are even less likely to account for the observed epidemiological features of MS.

What emerges from the epidemiological data is the singular fact that vitamin D/solar exposure is the single most important and modifiable environmental risk factor for MS. Vitamin D hypothesis explains the key epidemiological features of the disease, the antenatal risk and the protective effect of vitamin D-rich diet in northern population. Clearly, there can be little doubt that vitamin D supplementation should be routinely offered during pregnancy and childhood to prevent MS⁵.

References

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