An article in the washington post titled "Ancient DNA helps trace multiple sclerosis origins in European descendants" describes a study published in the journal *Nature* by Barrie, W. *et al*. which uses DNA sequenced from remains of ancient humans to trace disease-causing genes to specific points in human history, describing some hypotheses behind the evolutionary benefit of these genes[1].

The main disease discussed in the article is Multiple Sclerosis, a disorder where the immune system attacks myelin sheath, impairing the transmission of neuronal signals in white matter tracts in the brain. This can have debhilitating consequences, especially with regard to motor control, the networks responsible for which heavily incorporate myelinated white matter. The high risk of MS in people of Northern European descent is believe to be a result of immigration of cattle herders from Asia into Europe roughly 5000 years ago. The genes they brought are hypothesized to cause increased immune response to defend against pathogens from domesticated livestock, and helped prevent early death. Since MS tends to develop in adulthood, it is believed that the protection against infection allowed better survival chances prior to disease onset, and plenty of time to proliferate genes into the gene pool.

Other disease-related genes are discussed in the article, such as variants of APOE4, which are causally related to Alzheimer's disease onset, which appear to have been introduced into the European population with hunter-gatherers migrating to Europe roughly 45,000 years ago, although there are no hypotheses discussed in the article which postulate any potential evolutionary benefit for this gene variant.

The actual manuscript goes into significantly more detail about which genes where traced, specific ancestries traced, and provides extra details into which ancestries are least associated with MS, which was not mentioned in the article[2].

Overall, the article does a good job with summarizing the overall findings of the study, as well as providing additional commentary from the authors on the significance of their findings, although many of the more technical details are left out.

References

1. Johnson, C. Y. (2024, January 10). Ancient DNA helps trace multiple sclerosis origins in European descendants. *The Washington Post*. https://www.washingtonpost.com/science/2024/01/10/ancient-dna-multiple-sclerosis-european-ancestry
2. Barrie, W., Yang, Y., Irving-Pease, E.K. *et al.* Elevated genetic risk for multiple sclerosis emerged in steppe pastoralist populations. *Nature* **625**, 321–328 (2024). https://doi.org/10.1038/s41586-023-06618-z