

Motor Neurone Disease (MND) among Maltese in Malta and Australia is not linked to Poliomyelitis

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Abstract

To link death from motor neurone disease/amyotrophic lateral sclerosis (MND /ALS) with previous paralysis of poliomyelitis. The forebearers (parents, grand-parents, etc) of 196 Maltese with MND, who have died in Malta and Australia, were compared with records of 1072 Maltese with paralytic poliomyelitis. There is no evidence that MND was linked to previous poliomyelitis.

Keywords

amyotrophic lateral sclerosis, Australia, consanguinity, Malta, motor neurone disease, poliomyelitis.

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Introduction

There have been reports that past poliomyelitis might be a risk factor for motor neurone disease (MND), but proof has been lacking¹ and Armon et al have called for more studies.² Poliomyelitis and MND have shared symptoms, the motor neurones affected are similar in both diseases and the incidence in males is about 1.5 times greater than in females. Latent enteroviral infections have been (rarely) reported, but without MND symptoms.³ Some studies have reported finding enterovirus RNA in MND specimens, but this has been probably due to laboratory cross contamination.⁴

In Malta very few death certificates recorded MND before 1990, but reports have increased since the appointment of consultant neurologists. When infant mortality fell dramatically in the late 1940's, Maltese were encouraged to emigrate, especially to Australia. As poliomyelitis in Malta occurred in children whereas MND usually occurs in late middle age, in most countries it is difficult to match occurrence of both diseases in the same person. It is possible to do so in Malta because many hundreds of cases of polio occurred in young children before the 1950's and who are now of an age when MND is common.

Methods

This study comprises 148 Maltese whose death certificates included a diagnosis of MND: one was resident in England and two had been born in the USA, but had returned to Malta. One death in the USA and three in Britain were found from Maltese newspapers. The two earliest births were in 1898 and the latest was in 1979 (he died at the age of 20). The Health Information Unit (Malta) kindly supplied verified deaths from MND since 1990 and Dr. Geoffrey Dean provided some earlier ones. State registries in Australia sent photocopies of forty eight born in Malta who had been emigrants to Australia and whose deaths were certified as MND.

In 1985 the names of 1,072 Maltese children diagnosed with poliomyelitis were traced in the records of the Infectious Diseases Hospital and traced their parents, as well as those of baptism-matched controls. Marriages and births were traced in parish registers and the Public Registry, but registering marriages was voluntary until 1979 and probably about 10% were unregistered before 1900 and perhaps about 5% since then.

Results

MND and past poliomyelitis only 34 cases of polio were found before the 1942 epidemic. These 34 and most of the nearly 1,000 other polio cases born before their paralysis in 1950 had reached the age of 64 or older by 2010.⁶ The median age at death of both males and females for MND was 64 yr for those dying in either Malta or Australia, with the majority close to the median although the range was from 20 to 90 yr. If poliomyelitis is a risk factor for MND, many of the Maltese polios would have died of MND. None has done so yet.

There was little evidence in this study to link the two diseases. MND158 was the father of polio 859 and the control C 321. Polio 179 and MND 110 were sibs as were polio 981 and MND 127. It is possible that MND's might have more and closer links to polios than to controls (of the polios). Similarly, villages with many polios might be centres of MND incidence. In one village on the smaller island of Gozo there were 29 polio cases, with 23 related in one compact consanguineous family group, but the six others were not related to them. From the same village, there were four MNDs, two others with fathers of MNDs and two with a great grand-parent of an MND, but none was related to the polios.

There were a number of closely related polios in one village, but there were no MNDs there. In another area of several villages, there were closely related polios who were not related to a group of related MNDs in the same villages. Although the polios appear to be unrelated to the MNDs, it might be that individual polios and MNDs were closer to each other than to controls. The MNDs showed links to parents of two polios, 19 grand-parents and 21 great grand-parents of polios whereas the controls had links to five, 24 and 18 respectively.

Conclusion

This study and some others have found no evidence that previous poliomyelitis is linked with subsequent MND.^{7,8} One or two cases of MND occur in every 1,000 deaths, so that we may expect one or two to eventually occur with a MND having had polio. This will be coincident, not causal. The two diseases are different with different causes, even though they target the same cell – the motor neurone.

The data on cards, medical records, computer print-outs and notes etc will be deposited in the Melitensis Collection of the University of Malta. The Medical Ethics Committee of Malta had 'no objection to this study'.

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