Do children who become autistic consult more often after MMR vaccination?

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Summary

A close temporal association has been reported between the measles, mumps, and rubella (MMR) vaccination and dramatic behavioural decline in children subsequently diagnosed as autistic. We hypothesised that such a decline would be reflected in increased consultations with the child's general practitioner. The Doctor's Independent Network database was used to examine whether children subsequently diagnosed as autistic consulted more frequently than controls after MMR vaccination. No difference in consulting behaviour was seen in the six months post MMR. Any dramatic effect of MMR on behaviour seems unlikely.

Keywords: *autism; MMR vaccine, consultation behaviour.*

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Introduction

OVER the past two years a sometimes heated debate has continued over the alleged association between measles, mumps, and rubella vaccine (MMR) and autism.[1] In consequence, in the United Kingdom (UK) MMR vaccination rates have fallen.[2]

In 1998, Wakefield *et al*[3] reported an association between autistic-type disorder and gut disorders in a small series of children. In 8 out of 12 of these children their parents recalled a close temporal association between the onset of behavioural abnormalities and the MMR. The mean interval from exposure to first recalled behavioural abnormality was 6.3 days (range = 1–14).

The study and its interpretation have been criticised, and a large epidemiological study contradicted the alleged association.[4] This study was in turn criticised by the original researchers[5] (and others[6]) for its case-series methodology and because the researchers interpreted an isolated increase in reported parental concern in cases five months after the MMR, as being owing to recall bias. There is a need for high quality evidence and it is noteworthy that there have been no controlled studies in this area.

Method

The Doctor's Independent Network (DIN) database was used to obtain the data. This contains anonymised, computerised data from general practices that use Torex (formerly MEDITEL) software, covering over one million patients. The data collection is ongoing from 127 'core' practices providing lifelong medical histories for children who have remained with their practice since birth. The earliest that practices began to provide data was in 1989 and others have begun to provide data since then.

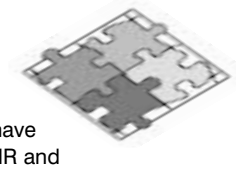
Our hypothesis was that, in the UK, any change in parental concern would be reflected in a change in consulting behaviour with the child's general practitioner (GP).

Using DIN, a cohort of children born into the practices while they were providing data was identified. Within this cohort, 79 cases with a coded diagnosis of autism were identified. One case was excluded where autism was diagnosed before MMR was given and seven who did not receive MMR. For the remaining 71 cases, four controls per case were selected from the cohort matched for age, sex, month of MMR vaccination, and GP practice. Controls had to still be registered with the practice on the date that autism was diagnosed in the case. Consultations with the Primary Health Care Team were counted in the six and two months before and after the MMR vaccination for cases and controls. Consultations were identified from the database using a computer algorithm that identified appropriate Read codes and counted any occurrences of such codes on a single day

Table 1.Consultation patterns of study cases and control group.

	Cases (n = 71)			Control (n = 284)			Paired difference (case-control)		
	Total consultations	Mean	Standard error	Total consultations	Mean	Standard error	Mean	95% CI	Wilcoxon rank sum test
Consultations within 2 months of MMR									
60 days before	81	1.14	0.17	335	1.18	0.09			
60 days after	78	1.04	0.19	321	1.13	0.08			
Difference	-7	-0.10	0.21	-14	-0.05	0.10	-0.05	-0.54–0.44	P = 0.45
Consultations within 6 months of MMR									
180 days before	295	4.16	0.44	1146	4.04	0.23			
180 days after	246	3.47	0.45	939	3.31	0.18			
Difference	-49	-0.69	0.34	-207	-0.73	0.20	0.04	-0.75–0.83	P = 0.59
Consultations in months prior to autism diagnosis									
60 days before	127	1.79	0.30	225	0.79	0.07	1.00	0.38–1.61	P = 0.007
180 days before	317	4.47	0.55	727	2.56	0.17	1.90	0.81–2.99	P = 0.009

HOW THIS FITS IN



What do we know?
Case-series studies and highly organised adverse event surveillance have not shown an association between MMR and autism. Considerable public anxiety remains about this alleged association.

What does this paper add?
This is the first controlled study to examine the alleged association. MMR vaccination does not appear to cause any dramatic decline in the behaviour of children who subsequently become autistic.

as being one consultation. The results of the algorithm were checked against printouts for 76% of the records and found to be accurate. Data were analysed using the Wilcoxon matched pairs signed ranks test.

Results

The median time between MMR and diagnosis was 1053 days (interquartile range = 678–1720 days). Only one case was diagnosed within six months of the MMR. The accompanying table summarises the results.

No significant difference in numbers of consultations in the six months and two months before and after MMR between cases and controls was identified. The distribution of the change in consultation rates in the two months before to the two months after MMR was identical in cases and controls and, on average, showed no significant change. When consultations in the six months before and after MMR were compared there was a significant fall in consultations in both groups reflecting increasing age but, again, no difference between cases and controls. In contrast, in the six months prior to diagnosis of autism the consultation rates were significantly higher in cases than controls.

Discussion

This is the first controlled study to examine this issue. It could be criticised because we cannot confirm that our cases truly suffer from autism. Autism, however, is not a diagnosis that is made in primary care, and the presence of a Read code for the diagnosis in the record almost certainly implies that the diagnosis had been made in secondary care. While some diagnoses will have been missed it seems unlikely these will be specifically those associated with MMR. The clear difference in consultations in the six months before the diagnosis of autism emphasises that consultations were being recorded and that differences in consultation rates between cases and controls were detectable.

In conclusion, there is no change in consultation behaviour in autistic children and matched controls in the six months after MMR. Our data suggest that Taylor *et al* were correct in suggesting that their observation of an isolated increase in parental concern five months post MMR is an artefact.[4] The original report of an effect of the MMR on the behaviour of children who subsequently were diagnosed as having autism may well be a result of selection or recall bias.

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