

TaqMan RT-PCR Detection of Measles Virus Genomic RNA in Cerebrospinal Fluid in Children with Regressive Autism

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Abstract

In light of encephalopathy, presenting in children as autistic regression closely following MMR vaccination, affected (ASD) children (n = 28) underwent lumbar puncture and examination of cerebrospinal fluid (CSF) for measles virus (MV) genomic RNA. Presence of MV Fusion (F) gene was examined by TaqMan RT-PCR. Control CSF samples (n = 37) were obtained from children in remission from leukemia (n = 20), children undergoing shunt insertion for hydrocephalus (n = 3) and young adults with either multiple sclerosis (n = 7) or encephalitis (n = 7). All ASD cases and pediatric controls had received MMR vaccine. MV hemagglutinin (H) gene allelic discrimination (AD) assay was performed on cases where adequate MV amplicon was obtained. MV F-gene was present in CSF from 19 of 28 (68%) cases and in one of 37 (3%) controls (RR = 25.90; CI 3.96-181.58, $p < 0.00001$). Where data were available on CSF (5 cases), AD assay confirmed that the MV H-gene product was consistent with vaccine strain. The findings confirm a highly significant statistical association between the presence of MV RNA in CSF and autistic regression following MMR vaccination.

Table 1:

Group	Sex (Male)	Age Median (range)	CSF		Gut Biopsy		Blood	
			MV +ve	AD Assay	MV +ve	AD Assay	MV +ve	AD Assay
Cases <i>n</i> =28	22	7 (2-15)	19/28 (70%)***	5 ¹	10/10	3 ¹	16/28	4 ¹
Controls <i>Leukemia (n</i> =20)	10	6 (1-17)	1/20 (5%)	n/a	n/a	n/a	n/a	n/a
<i>Hydrocephalus shunts (n</i> =3)	1	10 (2-11)	0/7 (0%)	n/a	n/a	n/a	n/a	n/a
<i>Multiple Sclerosis (n</i> =7)			0/7 (0%)	n/a	n/a	n/a	n/a	n/a
<i>Encephalitis (n</i> =7)			0/7 (0%)	n/a	n/a	n/a	n/a	n/a

¹Consistent with Schwarz vaccine strain

*Versus all controls RR = 25.90; CI 3.96-181.58, p<0.0001

**Versus pediatric controls (leukemia & hydrocephalus) RR = 16.10; 2.33-111.05, p<0.0001

3 cases previously reported, Bradstreet et al JAP&S Summer 2004.