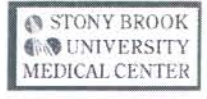


Hepatitis B vaccination of male neonates and autism



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PURPOSE:

Objective: To evaluate the association between hepatitis B vaccination (HBV) of male neonates and parental report of autism diagnosis among boys age 3-17 years, born before 1999.

Hypothesis: There will be a difference in the odds for autism among boys vaccinated at birth compared to later or never-vaccinated boys.

Background: In 1991, universal newborn HBV was recommended¹. Autism is a neurodevelopmental disorder. HBV associations with neurological, immunological, and developmental outcomes are mixed:

2001: No association between HBV and neurological events²

2001: Positive association with arthritis, ear infection and pharyngitis³

2007: No evidence of neuro-developmental delays at 6 months.⁴

2008: Increased odds for early intervention/special education (EIS)⁵

2009: Increased odds for central nervous system inflammatory demyelination⁶.

METHODS:

Design: Cross-sectional analysis of secondary data obtained from the National Health Interview Survey (NHIS) immunization and sample child files, 1997 through 2002**

Study sample: Males ages 3 through 17 years, with shot record available, born prior to 1999.

Exposure: Vaccinated during the first month of life (neonate): 1st dose HBV month and year equal to birth month and year, per immunization record.

Outcome: Parent report of professional diagnosis of autism.

Covariates: Race/ethnicity; maternal education; household composition.

Statistical analysis: Multiple logistic regression using SAS version 9.2 with Taylor Linearization for complex survey analysis and NHIS immunization sample weights.

RESULTS:

Table 1. Sample characteristics, boys age 3-17 years, NHIS 1997-2002

	with autism (n=33)	without autism (n=7,796)
HBV as neonate	9 of 31 (29%)	1,258 of 7,455 (17%)
Non-Hispanic white	16 (48%)	4,587 (59%)
Two-parents	19 (58%)	5,556 (71%)
Maternal education HS +	24 (73%)	5,755 (74%)

Table 2. Multivariate logistic regression results for odds for autism (weighted sample size = 31 with autism and 7,455 without)

	Odds ratio	P-value	95% CI
HBV neonate	2.944	0.032	1.099, 7.889
Non-Hispanic white	0.385	0.036	0.158, 0.937
Two-parents	0.303	0.009	0.123, 0.745
Maternal educ HS+	2.488	0.063	0.953, 6.498

CONCLUSIONS:

•HBV in US male neonates born before 1999 was positively associated with almost 3-fold greater odds for autism
- non-white boys were at greater risk

• Limitations:

- Cross-sectional design limits causal inferences.
- Autism diagnosis is parent-reported.
- This secondary data analysis does not support conclusions regarding risk attributable to specific vaccine components.

• Strengths:

- Probability sample-based association is generalizable to the US population of boys age 3-17 years, born prior to 1999.
- Vaccination status determined based upon immunization record.
- Controlled for confounders that may be associated with medical care seeking behaviors

References:

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2. Lewis et al. 2001. Pediatr Infect Dis J 20(11):1049-54.
3. Fisher et al. 2001. AEP 11(1):13-21.
4. Marques et al. 2007. Acta Paediatrica 96:864-868.
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6. Mikaeloff et al. 2009. Neurology 72:873-880.

**Analyses, interpretations, or conclusions are those of the authors, not the National Center for Health Statistics, which is responsible only for data collection.