

# Childhood meningitis associated with lower levels of educational achievement

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In a study that included nearly 3,000 adults from Denmark, a diagnosis of meningococcal, pneumococcal, or *Haemophilus influenzae* meningitis in childhood was associated with lower educational achievement and economic self-sufficiency in adult life, according to a study in the April 24 issue of *JAMA*.

Bacterial meningitis may lead to [brain damage](#) due to several factors, and survivors of childhood bacterial meningitis are at particular risk of hearing loss, [seizure disorders](#), motor deficits, and [cognitive impairment](#). Learning disabilities are well documented as a result of the disease. "To our knowledge, no previous study has examined functioning in adult life among persons diagnosed as having bacterial meningitis in childhood," the authors write.

Casper Roed, M.D., of Copenhagen University Hospital, Copenhagen, Denmark, and colleagues conducted a study to estimate educational achievement and economic self-sufficiency among children surviving [bacterial meningitis](#) compared with the general population. The nationwide population-based cohort study used national registries of Danish-born children diagnosed as having meningococcal, pneumococcal, or *H influenzae* meningitis in the period 1977-2007 (n=2,784 patients). Comparison cohorts from the same population individually matched on age and sex were identified, as were siblings of all [study participants](#). The end of the study period was 2010. The primary measured outcomes were cumulative incidences of completed vocational education, [high school education](#), higher education, time to

first full year of economic self-sufficiency, and receipt of disability pension and differences in these outcomes at age 35 years among meningitis patients, comparison cohorts, and siblings.

The study included persons who had a history of childhood meningococcal (n=1,338), pneumococcal (n=455), and *H influenzae* (n=991) meningitis. Among meningococcal meningitis patients, an estimated 11.0 percent fewer (41.5 percent vs. 52.5 percent) had completed high school and 7.9 percent fewer (29.3 percent vs. 37.2 percent) had obtained a higher education by age 35 compared with members of the population comparison cohort. For pneumococcal meningitis patients, by age 35, an estimated 10.2 percent fewer (42.6 percent vs. 52.8 percent) and 8.9 percent fewer (28.1 percent vs. 37.0 percent) had completed high school and higher education compared with members of the population comparison cohort.

Among *H influenzae* meningitis patients, 5.5 percent fewer (47.7 percent vs. 53.2 percent) had completed high school and 6.5 percent fewer (33.5 percent vs. 40.0 percent) had completed higher education by age 35 years compared with members of the population comparison cohort.

The authors also found that at end of follow-up, an estimated 3.8 percent, 10.6 percent, and 4.3 percent fewer meningococcal, pneumococcal, and *H influenzae* meningitis patients, respectively, had been economically self-sufficient compared with the individuals from the comparison cohort, and 1.5 percent, 8.7 percent, and 3.7 percent, respectively, more patients received disability pension.

"Siblings of meningococcal meningitis patients also had lower educational achievements, while educational achievements of siblings of pneumococcal and *H influenzae* meningitis patients did not differ substantially from those in the general population," the researchers write.

These findings suggest that the association with lower educational achievement and economic self-sufficiency in [adult life](#) may apply particularly to pneumococcal and *H influenzae* meningitis, whereas for meningococcal meningitis the lower [educational achievement](#) may be family related.

"Our study suggests that children diagnosed as having pneumococcal or *H influenzae* meningitis may benefit from follow-up into adulthood to identify those who could potentially benefit from psychosocial support."

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