

ORAL ABSTRACTS

1227. Familiality of fatal measles infections in Iceland, 1882. Analysis of a reconstructed patient cohort from a major epidemic

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Background. Measles epidemics cause significant morbidity and mortality worldwide but the reasons for differences in outcome between patients are poorly understood. Declining participation in childhood vaccinations is resulting in resurgence of

measles in some affluent countries, with fatal outcomes. We studied familial segregation of fatal measles in Iceland.

Methods. Iceland had a major measles epidemic in mid-year 1882, the first one to hit the country in 36 years and thus, almost the entire population was non-immune. This resulted in sharp mortality increase. We used historical records to identify the fatal cases. A nationwide genealogical database was used to quantitate segregation of fatal cases within families and calculate the risk ratios for relatives (RR) of those patients.

Results. During the epidemic, the mortality rate increased four-fold from baseline. We were able to identify 952 cases. Age specific mortality was highest among children 0-4 years of age, and among women of childbearing age, suggesting pregnancy as a risk factor. Parents of children who died of measles had a RR of 8.06 of fatal outcome ($p < 0.0001$). In summary, familiality analysis showed a significant increase in RR of relatives of 1st degree, 2.96 ($p < 0.0001$); 2nd degree, 1.67 ($p < 0.0001$); 3rd degree, 1.83 ($p < 0.0001$); 4th degree, 1.55 ($p < 0.0001$) and 5th degree, 1.40 ($p < 0.0001$).

Conclusion. The measles epidemic of 1882 in Iceland can be viewed as a natural experiment, introducing a virulent agent into a largely non-immune population. Using the Icelandic population registry with a national genealogy database we demonstrated a strong and highly significant familial risk of death from measles in the epidemic of 1882. This does not prove that host genetics dictate diversity in outcome from measles infection but provides significant reasons to try to determine whether or not it is the case.

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