

Pandemic preparedness through pilot testing of an international surveillance model capturing severe enterovirus infection

Background

Enteroviruses (EV), a group of viruses that can cause severe infections with central nervous system (CNS) involvement, are the causal agent for the majority of viral CNS infections. However, the burden of diseases caused by these viruses is largely unknown. In Denmark, as well as in the rest of the world, establishing a surveillance system for enteroviruses, specifically those subtypes known to cause severe disease such as EV-A71 and EV-D68, will inform public health authorities on endemic waves and epidemic signals.

Methods

We aim to establish valid and reliable surveillance data for enterovirus infections with CNS-involvement presenting as neurological syndromes (meningitis, encephalitis, meningoencephalitis, sepsis-like syndrome, acute flaccid paralysis/myelitis (AFP/AFM)), with information on clinical manifestation and genotype of the causing enterovirus. Utilizing existing clinical interests for infections in the CNS among adult and pediatric patients, clinicians seeing patients with suspected viral infections with CNS-involvement inform and enroll the patients in our pilot study. Demographic and clinical information will be collected at first medical examination, and clinical outcomes will be recorded no later than 3 months after the first medical examination of the patient. For laboratory diagnostics, CSF (cerebrospinal fluid) and stool/rectal and respiratory swabs will be collected on request of the treating physician and analyzed for enterovirus following local procedures. Further analysis of enterovirus-positive samples will follow at Statens Serum Institut.

Results

Enterovirus-infections with CNS-involvement results yearly in 6-130 hospital admissions (The National Patient Register, ICD-10: DA80, DA85, DA87*, DA88*) but yearly variance is massive, and validity of registration unmapped, calling for this surveillance.

The pilot routine surveillance is set up at three pediatric departments in Region Hovedstaden, with ongoing inclusion of more participating pediatric departments after proof of concept. All Danish departments of infectious disease is enrolled through the Danish Study Group of Infections of the Brain (DASGIB) where study information is collected for the existing clinical database.

Conclusion

The Danish first routine surveillance pilot sites start in April/May 2023. International sites are expected in September, participating through the European Non-Polio Enterovirus Network (ENPEN).

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