(1) Submission ID#1539712

A microbiological and clinical review of meningococcal eye infections in England: 2010-2022.

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Background

Neisseria meningitidis can cause serious systemic disease with devastating consequences but can also cause localised infections. Meningococcal infections of the eye (e.g. conjunctivitis and keratitis) can occur with or

without systemic disease and can lead to ocular complications such as corneal ulcers, scarring and, in extreme cases, visual impairment. Although rare, the UKHSA Meningococcal Reference Unit (MRU) has confirmed over 250 meningococcal eye infections in England since 2010. Here we present microbiological features and clinical aspects of these cases.

Aim/Methods

Meningococci isolated from eye swabs/samples were submitted to the UKHSA MRU for strain characterisation, including serogrouping/typing using monoclonal antibodies and antimicrobial susceptibility testing (etest, Biomerieux). Isolates were also whole genome sequenced and the resulting data uploaded to the Neisseria database at PubMLST.org for genetic indexing/characterisation. Clinical data were collated from various sources including UKHSA public health databases and clinical questionnaires.

Results

Between January 2010 and December 2022, the MRU received isolates from 260 episodes of meningococcal eye infection. Of these, 61.9% (n=161) were not groupable, with no capsular expression detected. Among encapsulated strains, serogroup B (MenB) was predominant (18.1% of all isolates), followed by MenY (5.8%), MenC (4.6%) and MenW (4.6%). Eighteen isolates (6.9%) exhibited resistance against at least one of the tested antibiotics including Benzylpenicillin, Rifampicin and Ciprofloxacin. Almost half of the cases (45.4%) occurred in infants aged < 1 year, and another 21.9% in 1-10 year -olds. Case numbers were similar across the older age groups. No significant differences in serogroup distribution were observed between age groups. Genomic analysis revealed that most isolates belonged to hyper-invasive clonal complexes including cc41/44, cc269, cc23 and cc11.

Conclusions

Meningococcal infection of the eye is rare in England but can result in clinical complications and progress to invasive, systemic disease. The age distribution was skewed towards young children which is consistent with other bacterial eye infections. Over a third were caused by encapsulated meningococcal strains belonging mostly to hyperinvasive lineages, which illustrates the underlying risk of progression to systemic disease following localised eye infections.