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Screening for *Corynebacterium diphtheriae*

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Abstract

A throat swab from a 9 year old girl with pharyngitis yielded a non-toxigenic strain of *Corynebacterium diphtheriae* var *mitis* and *Streptococcus* group G. *C pseudodiphtheriticum* was isolated from the throats of two of her four brothers. In each case the isolate was sent to the reference laboratory before full identification. The growth was found to be mixed for one brother; the other isolate being a toxin producing *C diphtheriae* var *gravis*. The child was asymptomatic and the case proves that all colonial types on the Hoyles plate should be identified.

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We have already suggested that routine screening for *Corynebacterium diphtheriae* should not be abandoned in the United Kingdom despite the current lack of staff and resources.[1] We describe a family outbreak that would not have otherwise been detected and which illustrates a potential pitfall in diagnosis.

Case report

A 9 year old girl presented with a history of sore throat and was noted to have pharyngitis, fever, and lymphadenopathy but no pharyngeal membrane. She lived with her parents and four brothers, aged 7 years, 5 years, 2 years and 4 months. They were not affected and she was treated with oral penicillin. Culture of the throat swab showed growth of a group G *Streptococcus*. Gram positive bacilli were observed on the Hoyles plate and later identified by API Coryne (BioMèrieux) as *C diphtheriae* var *mitis*. The Elek test and guinea pig inoculation showed the strain to be non-toxigenic. Treatment was changed to erythromycin.

The family were then requested to attend the general practitioner to have throat swabs taken and they were treated with erythromycin. The parents and two of the brothers were asymptomatic, but the 2 year old and the 4 month old brother had fever without a sore throat. The family had been in the United Kingdom for 13 years since leaving Malaysia. One month earlier, the parents and the youngest child had been on a pilgrimage to Mecca. The other children had been looked after by a grandmother who was visiting from Malaysia.

No pathogens were isolated from the pharyngeal cultures of the parents, the youngest child, or from one of the asymptomatic brothers. However, the throat swab from the 2 year old showed a heavy growth of a group G *Streptococcus* and, on Hoyles medium, of Gram positive bacilli, later identified by API Coryne as *C pseudodiphtheriticum*.

Culture of the throat swab of the asymptomatic 7 year old produced six colonies of a coryneform on the Hoyles plate. A subculture was made and the original plate was sent to the reference laboratory. The subcultured isolates did not produce a halo on a Tinsdale plate, and were later identified as *C pseudodiphtheriticum*. However, subcultures from the original plate at the reference laboratory showed two colonial types, one of which produced a halo on the Tinsdale medium. This isolate was identified as *C diphtheriae* var *gravis* and was shown to produce toxin both by the Elek test and by guinea pig inoculation. It differed from the strain isolated from the sister by producing acid from glycogen and not from sucrose. The second colony type was *C pseudodiphtheriticum*. Re-examination of the original culture of the sister's throat confirmed the presence of only non-toxigenic *C diphtheriae* var *mitis*.

Five days later, the mother complained of headache and malaise and was found to have tonsillitis and a nasal discharge. The father and all the children were well. The mother and three of the children were admitted to an isolation hospital and, with the exception of the youngest child, they were treated with antitoxin and another course of erythromycin. All throat swabs were negative and the mother made an uneventful recovery. Before her discharge from the hospital, the mother received low dose diphtheria vaccine and one child had a diphtheria toxoid booster.

Comment

The source of the two strains of *C diphtheriae* in this family is unknown. The parents or the baby may have been transient carriers of the organism after their pilgrimage, as may have the visiting grandmother. All of the children were known to have received vaccination against *C diphtheriae* toxin and this might have accounted for the lack of serious symptoms. In one United Kingdom survey, history of vaccination was not found to be a good predictor of immunity; 21% of those said not to have been immunised were not immune compared with 9% of those who had.[2]

This incident shows not only the importance of culturing routine throat swabs for *C diphtheriae*, but also that all colonial types on the

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Hoyles plate should be identified. Non-toxigenic strains can produce local symptoms similar to those caused by toxigenic strains and previous immunisation does not alter the incidence of these symptoms.[3 4] In addition to the Elek test, tests for pyrazinamidase and cystinase to screen for non-toxigenic and toxigenic species have been advised.[5] In this case, the child carrying the toxigenic strain had neither symptoms nor signs of infection and the mother had suggestive signs but without positive cultures.

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Severe thrombocytopenia secondary to asymptomatic cytomegalovirus infection in an immunocompetent host

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Abstract

A healthy 33 year old man presented with a short history of purpura and easy bruising. Investigations showed profound thrombocytopenia with atypical lymphocytes in the peripheral blood. Marrow appearances were consistent with platelet consumption. Biochemical hepatitis was also noted. An infection screen showed the underlying diagnosis to be cytomegalovirus (CMV) infection. He was treated successfully with oral prednisolone. This subsequently tailed off without relapse.

Careful examination of a stained blood film is needed in all cases of apparent idiopathic immune thrombocytopenic purpura.

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The most common form of cytomegalovirus (CMV) infection in the immunocompetent is asymptomatic and usually detected retrospectively. It is a well recognised cause of a "glandular fever"-like illness characterised by myalgia, malaise, headache, fever and sore throat.[1] Peripheral blood examination shows the atypical mononuclear cells present in all causes of this symptom complex—for example, Epstein Barr virus infection, toxoplasmosis, Q fever. The illness is usually self limiting and serious complications (such as haemolysis, Guillain-Barré syndrome, granulomatous hepatitis, carditis, pneumonia and meningoencephalitis), though well recognised, are rare.

Although thrombocytopenia is well described in congenital CMV infection,[2] there are only three recorded cases in otherwise healthy individuals.[3 5] We report a case of a man with acquired CMV infection presenting with purpura and bruising in the absence of other symptoms.

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Case report

A 33 year old male newsagent presented with a three day history of purpura, epistaxis, and easy bruising. He was otherwise asymptomatic and receiving no drugs. Examination showed that he was a healthy apyrexial man. There was extensive purpura over his limbs and trunk with haemorrhagic bullae in his mouth. Fundoscopy yielded normal results. There was no lymphadenopathy or hepatosplenomegaly.

Full blood count showed a platelet count of $5 \times 10 \times {}^{9}/l$ and a lymphocytosis ($4{\cdot}8 \times 10 \times {}^{9}/l$) with atypical mononuclear cells. The Monospot test was persistently negative. Sternal marrow appearances were consistent with thrombocytopenia due to peripheral consumption; megakaryocyte morphology was normal. Coagulation screen was normal apart from a prolonged KCCT at 47·3 seconds (normal range 30–41), and tests for lupus-like anticoagulant (dilute Russell viper venom time with platelet neutralisation procedure) were positive; anticardiolipin antibodies were not detectable. Liver function tests showed raised transaminases (ALT 288 IU/l, AST 88 IU/l, alkaline phosphatase 14 IU/l, and glutamyl transferase 136 IU/l). Hepatitis screen (including hepatitis A, B, and C), autoantibodies including antinuclear antibody, rheumatoid factor, and anti-double stranded DNA were negative. CMV titres performed on the day following admission showed a titre of 320 with anti-CMV IgM detected, indicative of recent infection.

Treatment with prednisolone 80 mg per day was started shortly after admission. The platelet count was initially slow to respond; at