Short Communication

Increasing incidence of group A streptococcal infections amongst injecting drug users in England and Wales

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During 2000, the UK witnessed a sudden increase in severe infections and related deaths in injecting drug users (IDUs), sparking off a UK-wide investigation. A worrying upward trend in severe group A streptococcal (GAS) infections has recently been observed in IDUs based upon isolate referrals to the PHLS Respiratory and Systemic Infection Laboratory. Most cases were young male adults who presented with skin sepsis and bacteraemia. Serotyping revealed a diverse range of M types, with higher types predominating in some geographical areas. The data suggest that GAS invasive soft-tissue infections may present in an epidemic fashion among IDUs in the absence of a common source.

Introduction

Reports are emerging from several different countries of significant increases in soft-tissue and invasive bacterial infections associated with injecting drug use (Böhlen *et al.*, 2000; Lehot *et al.*, 2001). In the UK, an outbreak of severe infections and death amongst injecting drug users (IDUs) was observed in 2000 (Jones *et al.*, 2002). Microbiological investigation of patient specimens and recovered heroin samples implicated several aerobic and anaerobic bacterial species, in particular *Clostridium novyi*, but not streptococci (McLauchlin *et al.*, 2002). Since then, sporadic cases and clusters of severe disease in IDUs caused by other organisms, in particular, group A streptococci (GAS) (Böhlen *et al.*, 2000), have been documented. It has been suggested that high rates of GAS pharyngeal carriage could be a major contributing factor (Böhlen *et al.*, 2000). However, close contact within IDU social networks and/or the use of shared substances and needles could also be contributing factors.

Methods and Results

We have analysed data on 5209 invasive (sterile site) GAS isolates received between 1995 and 2001 by the PHLS Streptococcus and Diphtheria Reference Unit (SDRU) from across England and Wales and compared this with national surveillance data. The temporal trends in the SDRU reports closely followed those from invasive GAS reports received through routine laboratory reporting to the PHLS Communicable Disease Surveillance Centre (CDSC) (Fig. 1). A marked increase in GAS sterile-site isolate referrals from IDUs

occurred between 1999 and 2001 in England and Wales. From 1995 to 2001, a total of 211 blood culture and other sterile-site GAS isolates from IDUs were referred to SDRU; 81 sterile-site GAS isolates were received during the first 9 months of 2002 (Fig. 2). Of these cases, 87 % were young adults (18–30 years) who presented with skin sepsis and bacteraemia. Cases were referred from throughout England and Wales, and the overall proportion of all GAS invasive disease cases amongst IDUs increased to 15 % during 2002, in contrast to less than 5 % between 1999 and 2001.

A total of 12 different M serotypes, which included M1, M4, M11 and M22, predominated during 1997–1998, with 'higher types', M78, M82, M83, M87 and M89, emerging during the latter years. M-non-typable strains comprised 38 % of all isolate referrals from IDUs during 1995–2002, which is significantly higher in comparison with the overall M-non-typability rate of GAS isolates from other invasive disease (approx. 18 %). So far, *emm* sequencing of M-non-typable strains has revealed a novel *emm* sequence type in a GAS isolate from an IDU in the south of England. The serological characteristics of this strain are T- and M-non-typable, opacity-factor-positive and resistant to tetracycline. The predominant sequence types were *emm*ST94, ST77, ST83-1, ST68-1, ST68-3 and ST43-4. M-antisera to these higher types are not available, with the exception of type 77. The remainder of the M-non-typables covered a diverse range of 14 different *emm* sequence types. Studies are continuing to sequence all GAS M-non-typable strains since 1995 and to determine the prevalence of these and other potential novel types amongst GAS isolates from invasive disease generally.

Abbreviations: GAS, group A streptococcus; IDU, injecting drug user.

Fig. 1. GAS: sterile-site referrals and laboratory reports to the PHLS, January 1998–July 2002.

Fig. 2. Invasive isolates of GAS from IDUs and non-IDU patients, January 1995–September 2002. The asterisk indicates that data for 2002 are for 9 months (January–September) rather than for a full year.

Antimicrobial susceptibility testing of GAS isolates from IDUs during 2000–2002 (144 isolates) showed all strains to be susceptible to penicillin ($\text{MIC} \leq 0.06 \text{ mg l}^{-1}$). Five strains were erythromycin-resistant ($\text{MIC} > 8 \text{ mg l}^{-1}$); one strain was erythromycin- ($\text{MIC} 16 \text{ mg l}^{-1}$) and clindamycin- ($\text{MIC} > 256 \text{ mg l}^{-1}$) resistant; 34/143 (24%) were tetracycline-resistant ($\text{MIC} 2\text{--}128 \text{ mg l}^{-1}$) and two were both tetracycline- and erythromycin-resistant. There was no definitive correlation between serotype and antimicrobial susceptibility pattern.

Discussion

Although the increased awareness following the large cluster of ‘unexplained illness’ among IDUs during 2000 may have enhanced microbiological sampling in IDUs, and thus case ascertainment, the trends seen by SDRU pre-date that outbreak. The significant publicity and availability of guidelines for microbiological investigation of IDUs with sepsis could also be a contributory factor towards this ‘upsurge’ in case identification. However, the findings from a recent London cluster, where risk-factor information was available

and routine sampling had been undertaken in a consistent fashion since 1970, argue against increased ascertainment as the sole explanation for the observed increase (PHLS, 2002).

In addition, the geographical and temporal dissemination, along with the serological data, do not suggest a drug contamination problem. The increase may also reflect an increased vulnerability in IDUs to skin sepsis through a change in risk behaviour. Data from the Unlinked Anonymous Survey of IDUs have shown marked increases in needle/syringe sharing behaviour in the late 1990s (Department of Health, 2001).

Further epidemiological investigation needs to be undertaken urgently to characterize GAS risk factors further in this group, particularly injecting practices. We therefore urge all clinicians and microbiologists to maintain a high index of suspicion and to report all cases to the PHLS CDSC and refer all GAS isolates from IDUs to SDRU for typing. Furthermore, as of January 2003, 11 European countries, including the UK, will undertake a period of enhanced surveillance for severe GAS disease. The surveillance forms a major part of a pan-European programme supported by the European Commission, Fifth Framework (QLK2.CT.2002.01398) on ‘Severe *Streptococcus pyogenes* invasive disease in Europe’, ‘strep-EURO’, which should provide essential data on the overall burden of these infections in addition to trends in type distributions, antimicrobial susceptibilities and clinical manifestations throughout Europe. The results from the surveillance should therefore help to place the current trends observed in the UK in a pan-European context (Schalén, 2002).

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