

An invasive group A streptococcal infection outbreak: A community nursing experience

Abstract

Invasive group A streptococcus (iGAS) can cause serious infections. Between January-July 2018, seven patients', living in the same geographical area and receiving district nursing care for wound management, were identified with iGAS. Further microbiological analysis of the cases identified the iGAS cases were the same type, *emm* 94. This was an unusual strain and suggested there was likely transmission via staff and contaminated equipment.

Outbreak measures were implemented, including staff screening followed by commencement of chemoprophylaxis without waiting for results. No staff were identified as positive and no further cases identified.

This outbreak report discusses the implementation of mass staff screening and the prompt commencement of chemoprophylaxis. This approach enabled staff to continue providing services and was an effective approach to managing outbreaks of this nature in a community setting. However, effective implementation requires early engagement from stakeholders to ensure clear communication and rationale is provided for staff.

Key words: Infection prevention and control, invasive group A streptococcus, district nursing, outbreak, staff screening, chemoprophylaxis

Introduction

Group A Streptococcus, also known as GAS commonly colonises throat, skin and can cause throat infections and mild skin and soft tissue infections (Public Health England, 2014). However, invasive GAS infection, can cause serious infections including septicaemia, and necrotising fasciitis with fatality reported in about 20% of cases (Steer et al., 2012). It is a notifiable infection in the United Kingdom (UK).

Transmission is usually by direct person to person contact via inhalation of respiratory droplets or touch. However, it can be transferred by contact with contaminated equipment (Efstratiou, A. & Lamagni, T., 2016). Older people, with co-morbidities including diabetes, or cardiovascular disease are more at risk of developing iGAS (Public Health England, 2017).

In July 2018, on admission to an acute Trust, three patients were identified with iGAS, within a week of each other. The patients were elderly, all lived in the same geographical area and had complex long-term wounds which were managed by the local district nursing service.

A large outbreak was identified, and this report, based on ORION guidelines for reporting (Stone et al 2007), will discuss the interventions and measures implemented and the importance of staff screening and chemoprophylaxis in preventing further cases within a vulnerable population.

Outbreak investigation

Retrospective review of cases

Between 24th and 28th July 2018, Public Health England were informed of three elderly patients, who were identified with iGAS on admission, after presenting with symptoms of cellulitis to the local acute hospital. The patients were all aged over 80 years, lived in the same geographical location, admitted from home, and had been receiving treatment for leg ulcers from the community nursing team.

Initial response and outbreak management

In response to these three cases, an outbreak group meeting was convened on 31st July 2018. This group included representation from Public Health England, local healthcare providers and stakeholders, during which immediate actions were taken.

An initial review included investigations for common sources, including contact with care agencies, private care providers, GP services and tissue viability nurses. There were no obvious links between patients and these services. However, the three cases were well known to the district nursing team and the outbreak team focussed on this team as a possible source for transmission.

The following immediate actions were also taken (table 1).

Table 1: Initial immediate actions taken by Infection Prevention and Control (IPC) team and clinical leads

Issue	Action
Source of transmission- review of clinical practice and infection prevention and control practices	Review of hand hygiene practice and audits Buddied clinical practice visits Review of decontamination procedures of equipment
May be additional cases not yet detected	Enhanced surveillance including look back (till January 2018)
	Review of clinical staff contacts and network analysis of staff and patient contacts. Active case findings
	Raised awareness of signs and symptoms of iGAS with team and set a low threshold for sending specimens.
Sources may involve household contacts	Review of household contacts for symptoms of GAS
iGAS type may be different and not related	Organism typing
Need for a clear communication strategy to include patients, family, GP's and district nursing staff	Communications were sent via the Trust and Public Health England
Staff may be colonised with GAS	Rapid review of staff for signs and symptoms of GAS i.e sore throat, including skin for any lesions by occupational health team
	Comprehensive and rapid staff screening GAS followed by immediate chemoprophylaxis. This

	<p>consisted of Penicillin V 500mg qds for ten days, or azithromycin 500mg once daily for five days if penicillin allergic (PHE 2008)</p>
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Infection prevention and control review

Identification of community nurses involved with the three patients and a review of IPC practices was undertaken. As the cases were all under the care of the same district nursing team, the IPC lead for the employing organisation, undertook an immediate review of IPC practices including hand hygiene compliance, including bare below the elbows, clinical practice and decontamination of medical devices equipment.

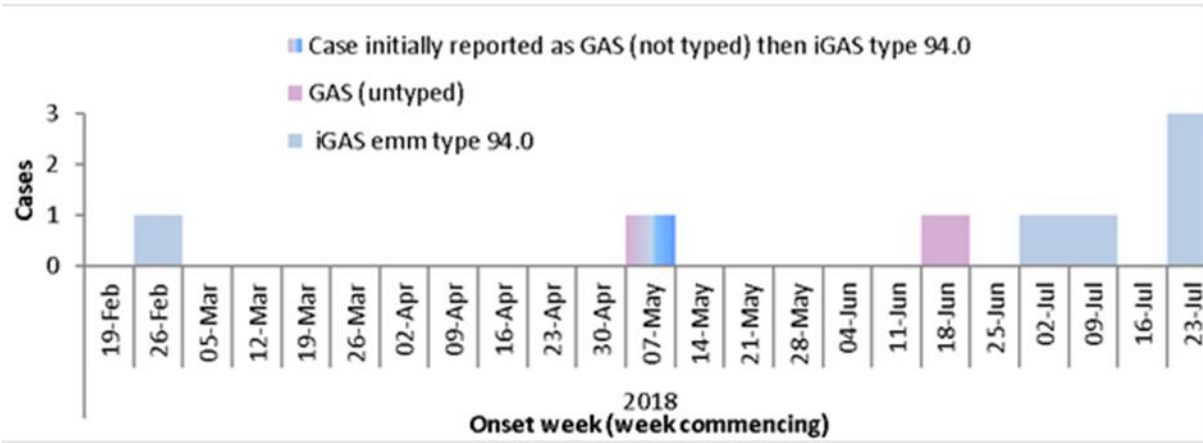
A follow up meeting was held one week later to review actions and update on new information. No further interventions were required.

Epidemiological investigation

Following a look back exercise, a further four cases were detected, by searching positive iGAS results, totalling seven iGAS patients and one non-invasive GAS infection (household contact) (figure 1). The cohort of patients affected in this outbreak were all elderly with a median age of 81 years. Two patients passed away following the outbreak and iGAS may have contributed.

Figure 1: Onset of cases

Epicurve of case onset



Microbiological investigation

The causative iGAS strain was identified as type emm 94, and usually associated with patients who inject drugs or are homeless (Kwiatkowska et al, 2018). It is relatively uncommon accounting for only 4.8% of iGAS cases nationally during the same time period January-September 2018.

Staff screening and chemoprophylaxis

Investigation identified the only commonality between the cases, was the same district nursing team delivered care to all affected patients. Initially staff identified as having contact with the three affected patients were screened and given chemoprophylaxis. It is possible the first two iGAS cases were heavily colonised (large numbers of GAS colonies present in specimens), and there was frequent and extensive contact with staff. However, network analysis of staff and patients interaction did not identify a point source.

This resulted in the decision to screen and treat the whole nursing team, including managers (2) and administrative staff (2), as the team shared offices and mixed daily. This was in recognition of the low sensitivity of screening results and allowed staff to continue working by eliminating occult carriage. None of the staff screened presented with skin infections, therefore no skin swabs were taken. Of the 21 nurses, working in the team, 18 were directly involved in the care of at least one case. This patient had complex long term wounds and positive GAS results.

Screening was undertaken by the Trust's occupational health team. Chemoprophylaxis was prescribed by an urgent care nurse prescriber (see table 1). All the results were negative for GAS and all staff completed chemoprophylaxis. A 30-day enhanced surveillance period was instigated following the third case (August) during which there were no further cases. The outbreak was declared over on 3rd September 2018.

Discussion

The outbreak was due to an unusual type of GAS. Network analysis of staff working patterns and patient contact, suggested there was possible transmission between clinicians, following frequent contact with cases. Although the current PHE guidance advised screening staff and waiting for results before starting chemoprophylaxis treatment (PHE 2014), the decision to start chemoprophylaxis immediately was made. This was primarily due to a similar outbreak within a community nursing team, which implemented chemoprophylaxis before screening results were available, allowing continuation in care provision whilst reducing the risk of further iGAS cases (Olufon et al, 2015).

Screening for iGAS, consisted of a throat swab and although GAS may colonise other body sites including anal and vaginal, these sites are not routinely screened (Steer et al., 2012). In this outbreak, only throat swabs were taken, therefore treatment was offered to all staff in cases there was carriage elsewhere on the body, with risk of possible transmission from staff to vulnerable patients.

There were several learning points from this outbreak. Firstly, prescribing chemoprophylaxis within a community Trust, when the occupational health service are not prescribers was difficult. Alternative prescribers needed to be sourced and an appropriate location identified to facilitate staff to attend. Another challenge was some staff were reluctant to take chemoprophylaxis as this was outside the

existing PHE guidelines. Site visits and face to face communication were vital in engaging and addressing concerns. Lastly, accurate record keeping, and comprehensive surveillance systems were important in identifying further cases. One case was identified by organisational memory, where the Trust IPC nurse remembered a community case, several months earlier, who was seen in the organisation's emergency assessment unit but not admitted. Other learning identified the importance of communication, accurate record keeping of staff and student nurse contacts for contact tracing, six monthly hand hygiene audits, improved medical devices cleaning checklists, and increased quality clinical visits with senior nurses buddying staff. With no point source identified, using a multi modal approach was important to improving IPC practices. This approach is likely to have contributed the conclusion of the outbreak and no further cases.

Limitations

Staff screening was confined to a throat swab only. It is possible some staff may have been colonised with GAS in other body areas, not screened and therefore inadvertently contributed to the outbreak.

Conclusion

This was a large and unusual outbreak of iGAS within a vulnerable community population. In the absence of a clear source, the implementation of staff screening followed by immediate chemoprophylaxis is recommended. This approach enabled staff to continue to work safely and avoid medical suspension whilst waiting for results.

National community guidance should recommend prompt screening and chemoprophylaxis treatment for community outbreaks of iGAS. Community healthcare providers should ensure there is a robust, timely process to manage staff screening and chemoprophylaxis, including effective communication, rationale and support for staff. The importance of maintaining IPC practices within a community environment should be emphasised in organisational training and procedures.

Declaration of conflicting interests

The Author declare that there is no conflict of interest.

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