Increasing Incidence of *Streptococcus Dysgalactiae* subspecies *Equisimilis* Osteoarticular infections

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Background

Osteoarticular infections cause significant morbidity worldwide. Streptococci are consistently second only to staphylococci as causative microorganisms, and historically, group A streptococci (GAS) has comprised the majority. *Streptoccocus dysgalactiae* subspecies *equisimilis* (SDSE), a beta-haemolytic streptococcus predominantly possessing Lancefield group C or G antigen, has recently emerged as an important pathogen, increasingly implicated in invasive disease.

We wished to explore if this rising trend was reflected in the rates of osteoarticular SDSE-infections, and furthermore, to describe the host and pathogen characteristics of these infections.

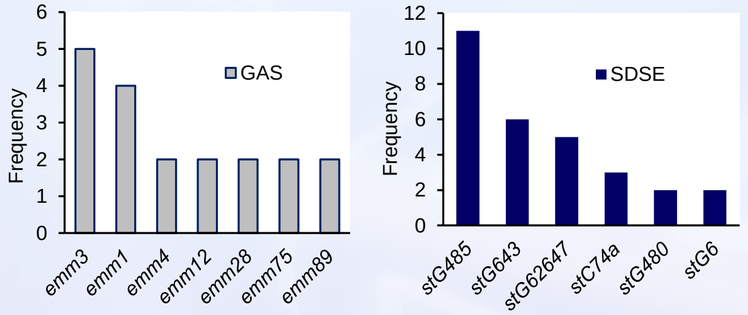
Methods

All Group A streptococci (GAS) and SDSE osteoarticular infections at Haukeland University Hospital in western Norway from 1999 to 2013 were retrospectively identified. Cases were classified as native joint infections (NJI), periprosthetic joint infections (PJI) or acute osteomyelitis, including spondylodiscitis (AOM). Patients with chronic osteomyelitis (symptoms >4 weeks) were excluded. Isolates were identified by phenotypic traits and serogroup specificity, and *emm*-typing was performed. Time trends were evaluated by calculating mean incidence rate ratios (IRR) from an early cohort (1999-2003) and a late cohort (2009-2013).

Results

We identified 25 GAS and 50 SDSE osteoarticular infections, comprising 14 and 23 NJIs, 6 and 19 PJIs and 5 and 8 AOMs caused by GAS and SDSE, respectively. The incidence of SDSE infections, but not GAS, increased significantly from 0.4/100 000 to 1.5/100 000 during the study period (IRR 4.7, p<0.001).

Figure 1 *emm*-distribution of clinical isolates



22 GAS and 36 SDSE-isolates were available for molecular characterization. *emm*-types encountered more than once are presented above.

Conclusion

The incidence of *Streptococcus Dysgalactiae* subspecies *Equisimilis* osteoarticular infections increased significantly during the study-period.

SDSE-infections were clearly linked to predisposing conditions of both local (prosthesis) and systemic origin (age, comorbidity).

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Table 1 Clinical characteristics

Characteristics	GAS, n=25	SDSE, n=50	GAS vs SDSE
Age, median (IQR)	49 (9-71)	70 (56-81)	**p=0.002[a]**
Male gender	16 (64%)	31 (62%)	ns[b]
Comorbidity			
Prosthesis	6 (24%)	19 (38%)	ns[b]
Immunosuppression	1 (4%)	5 (10%)	ns[b]
Malignancy	1 (4%)	8 (16%)	ns[b]
Any comorbidity	12 (48%)	35 (70%)	ns[b]
Comorbidity and/or prosthesis	8 (32%)	3 (6%)	**p=0.005[b]**
Outcome			
Mortality	2 (8%)	2 (4%)	ns[b]
Sequela	10 (45%)	17 (34%)	ns[b]
Severity			
SIRS	18 (72%)	23 (46%)	ns[b]
STSS	2 (8%)	2 (4%)	ns[b]

Presented as number of cases (%), except age presented as median (inner quartile range). ns, not significant ; [a]Mann Whitney U-test ; [b]Fischer's exact test ; SIRS, systemic inflammatory response ; STSS, streptococcal toxic shock syndrome.

Figure 2 Incidence of osteoarticular infections