

Clinical & molecular epidemiology of emerging *S. aureus* ST398 strains associated with bloodstream infections in France



N.L. van der Mee-Marquet^{1,2}, X. Bertrand³, P.-Y. Donnio⁴, A.-S. Valentin¹, N. Girard², R. Quentin¹ and the Réseau des Hygiénistes du Centre Study group.

¹Service de Bactériologie et Hygiène, Centre Hospitalier Universitaire de Tours, France. ²Réseau des Hygiénistes du Centre, Centre Hospitalier Universitaire de Tours, France. ³Service d' Hygiène Hospitalière, Centre Hospitalier Universitaire de Besançon, France. ⁴Service de Bactériologie, Virologie, Hygiène Hospitalière, Centre Hospitalier Universitaire de Rennes, France.

INTRODUCTION AND PURPOSE

Since 2000, a survey of bloodstream infections (BSI) has been under way in France (JCM,2009.47:2863-71,2007.45:851-7 & 2004.42:5650-7). Since 2006, an increase with incidence involved methicillin-sensitive *S. aureus* strains, associated since 2009 with emergence of ST398 strains (CID.2011.52:152-3). Our objective was to characterize the clinical and molecular epidemiology of ST398 and non ST398 strains involved with 456 BSI cases diagnosed since 2007 in the region Centre of France.

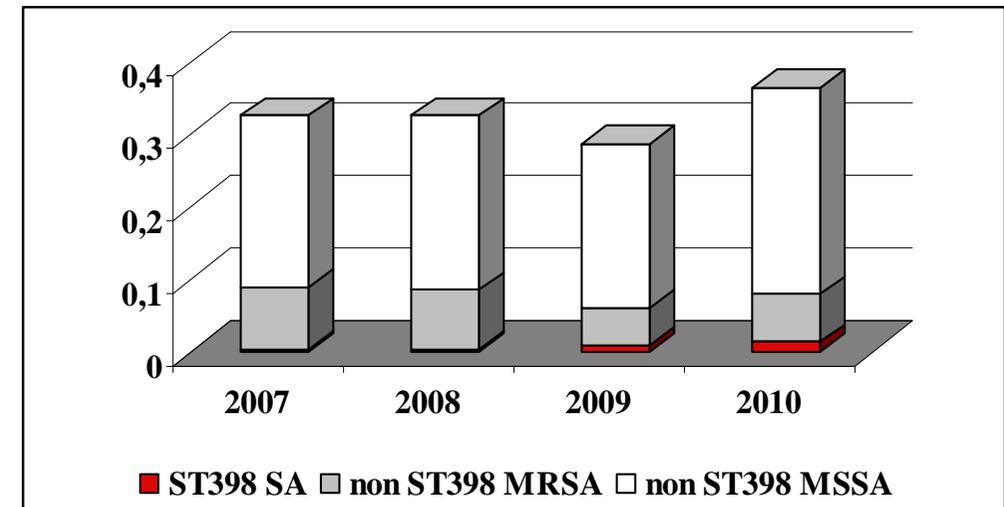
METHODS

A cohort of 23 healthcare institutions were involved and participated with the three month survey periods conducted in 2007, 2008, 2009 and 2010 (1 388.860 patient days). For all BSI cases, demographic and clinical data were collected: age and sex of the patients, portal of entry (skin, surgical site, lungs, urine, intravascular device, or digestion), community-associated/hospital-acquired BSI, death within 7 days of BSI diagnosis. Antibiotic susceptibility testing and PFGE were performed for all *S. aureus* strains isolated from BSI during the four survey periods. ST398 strains were further characterized (*spa* type and MLST).

RESULTS

Incidence. Incidence of BSI associated with MSSA increased (0.239/1000 PD in 2007, 0.296 in 2010) as well as incidence with ST398 strains : 0.003 in 2007, 0.014 in 2010 (Figure 1). Clinical & molecular epidemiology of ST398 and non-ST398 strains differed strongly. **Microbiological characteristics.** Compared with non-ST398 strains, ST398 strains were mostly susceptible to methicillin (9/10, 90 %, versus 347/446, 78 %) and resistant to erythromycin (9/10, 90 %, versus 62/446, 14 %; $p < .001$). ST398 strains were characterized by different *spa*-types mainly t571 and t1451, a susceptibility to tetracycline (9/10) and a lack of PVL production (10/10), indicating that they differed from European pig-borne strains (*spa*-types 011 or 034, Tet^R) and shared similarity with Chinese-type (*spa*-type 571, Tet^S). **Clinical data.** Compared with non ST398, ST398 cases were diagnosed in younger patients (mean age 57 vs 67 years), all hospital-acquired (10/10), but nevertheless observed in patients hospitalized in unrelated hospitals. Among nosocomial BSI, compared with non ST398, ST398 cases were often diagnosed following surgery (3/10, 30 % versus 38/239, 16 %) or with a digestive portal of entry (3/10, 30 % versus 9/239, 4 %; $p = .008$). Examination of patient history revealed no exposure to animals in all ST398 BSI cases, thus questioning us how the present ST398 strains were transmitted.

Incidence of *S. aureus* BSI (/1000 PD)



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