

An update of serogroup Y meningococci in Italy: 2012-2014

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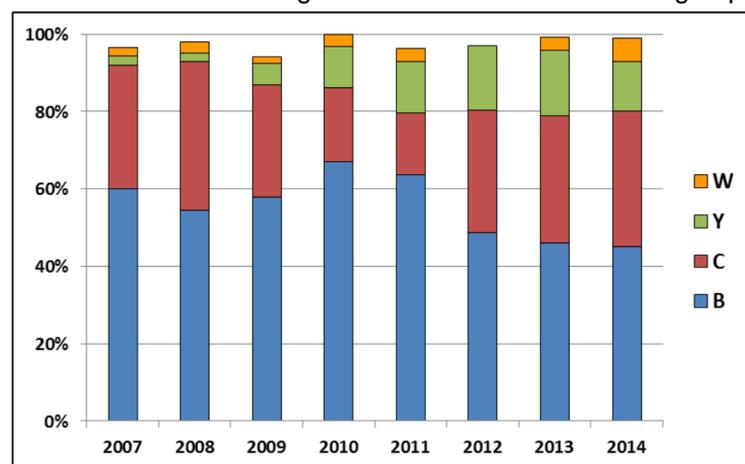
Introduction

During the last twenty years significant increase of serogroup Y *Neisseria meningitidis* (MenY) cases has been reported worldwide [1, 2]. In Italy, although the incidence of Invasive Meningococcal Diseases has remained quite stable in 2012-2014 (mean annual incidence= 0.25 cases/100,000 inhabitants), the rate of meningococcal serogroups has been changed. The aim of this analysis was to describe the clinical and the molecular features of invasive MenY isolates collected from 2012 through 2014 in Italy.

Results

During the study period the proportion of serogroup C isolates increased from 32% in 2012 to 35% in 2014, whereas serogroup B decreased from 49% in 2012 to 45% in 2014. The proportion of serogroup Y, in agreement with previous years, showed a constant increase in 2012 (16.5%) and in 2013 (16.8%). However, in 2014 this proportion decreased to 13% (Figure 1).

Figure 1. Annual proportion of Invasive Meningococcal Diseases due to serogroup B, C, Y and W in Italy, 2007-2014.



Out of 51 patients infected by serogroup Y meningococci, 15 were women and 36 men, with a median age of 23 years (ranging from 3 months to 85 years). The highest proportion of serogroup Y cases was in adults aged 45-64 years (26%, n=13), followed by the age group 5-14 years of age (24%, n=12). Meningitis was the most frequent clinical presentation, accounting for 48% of all cases, followed by septicaemia (36%) and meningitis and septicaemia (16%).

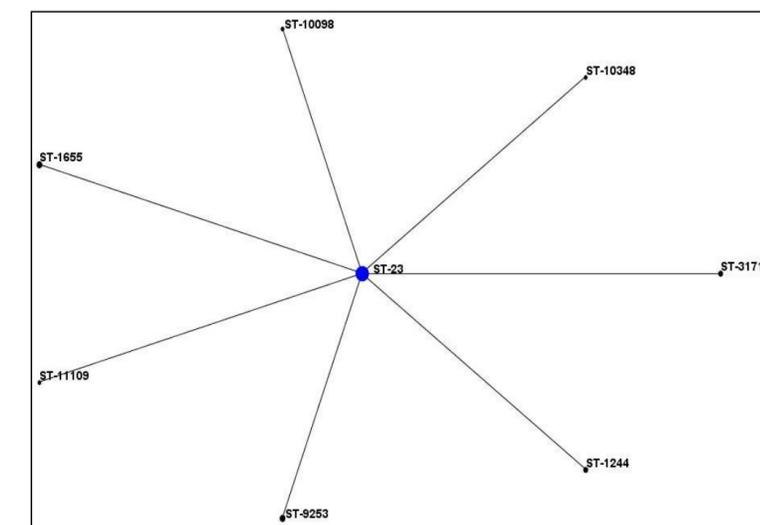
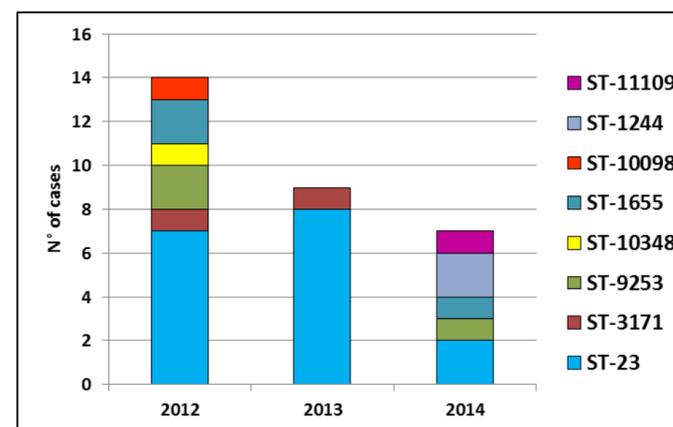
All MenY isolates were susceptible to rifampicin, ciprofloxacin and ceftriaxone. Moreover, 58% of them showed a decreased susceptibility to penicillin G (penI) (MIC₅₀ and MIC₉₀ were 0.094 and 0.125mg/L, respectively), similarly to what found among other serogroups (56%) (data not shown). ST-23/Cluster A3 complex (ST-23 cc) is the only clonal complex (cc) detected. Eight different sequence types (STs) were found: ST-23 (17 isolates, 57%), ST-9253 (3 isolates, 10%), ST-1655 (3 isolates, 10%), ST-3171 (2 isolates, 7%), ST-1244 (2 isolate, 7%); ST-10348, ST-10098 and ST-10098 were singletons and correspond to new MLST profiles, (Figure 2).

eBURST analysis clustered all STs belonging to the ST-23 cc in the same group. The ST-23 was determined as the founding genotype, with all others STs as single-locus variants, (Figure 3). The PorA VR1, VR2 and FetA, most frequent variants were: 5-2, 10-2 and F2-13.

Material and Methods

From 2012 to 2014, 51 serogroup Y cases has been reported and 36 MenY samples were sent to National Reference Laboratory at the Istituto Superiore di Sanità. Serogroup and antibiotic susceptibility for penicillin, ciprofloxacin, ceftriaxone and rifampin were also determined. Each isolate was genetically characterized by MultiLocus Sequence Typing (MLST), PorA-VR1 and VR2 typing and FetA typing, as described in <http://neisseria.org/>. MLST data were analysed by eBURST, version 3. Moreover, the *lpxL1* gene amplification and sequencing were performed as described by Ladhani et al. [3].

Figure 2. Distribution of Sequence Types (STs) belonging to the ST-23 clonal complex . **Figure 3.** eBURST analysis of ST-23 clonal complex .



Among the 21 MenY, 81% (17/21) were *lpxL1* type XVII, 9.5% (2/21) type VI and 9.5% (2/21) type XVI.

Conclusions

- The proportion of serogroup Y meningococci in Italy was 16.5% in 2012 and 13% in 2014.
- The age group 45-64 years was the most affected, older than patients infected by other serogroups.
- All serogroup Y isolates were susceptible to the antimicrobials tested. However, an high proportion of PenI was also observed.
- MenY were genetically similar belonging to ST-23 cc, one of the most frequently cc detected among MenY in Italy as well as in other Countries.
- Monitoring changes in the trend of the different serogroups and, of the MenY in particular, are essential for vaccination strategies.

References

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