Long-term surveillance of ANTIMICROBIAL RESISTANCE OF *H. influenzae* IN RUSSIA: are there any changes in ten years?

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Bachground. To investigate the antimicrobial resistance of *H.influenzae* in different regions of Russia from 2004 to 2013.

Methods. Clinical isolates of *H. influenzae* have been collected for ten years and stored in the central laboratory of Institute of Antimicrobial Chemotherapy in Smolensk at -70°C. Conventional methods (X-, V-factors requirement, biochemical tests) as well as MALDI-TOF MS (Microflex-LT, Biotyper System, Bruker Daltonics, Germany) were used for identification of the isolates. MIC of 8 antimicrobials were determined by broth microdilution method using cation-adjusted Mueller-Hinton broth (BBL, USA) supplemented with 5% lysed horse blood and 20 mg/L β-NAD (MH-F broth) according to EUCAST guidelines (version 5.0, 2015).

Results. A total 737 of non-duplicated strains of *H. influenzae* were included in the study for ten-year period (2004-2013). The majority of isolates in 2004-2005, in 2006-2009 and in 2010-2013 were isolated from respiratory samples : 86,8%, 89,2%, 94,5% respectively.

The susceptibility testing results (I/R, %) are presented in the Table.

Conclusions. The majority of *H.influenzae* retained good *in vitro* susceptibility to different classes of antimicrobials for ten-year period of the study. β-lactams (amoxicillin, amoxicillin/clavulanic acid, ceftriaxone) and respiratory fluoroquinolones had high *in vitro* activity against tested isolates. No resistant strains to levofloxacin, moxifloxacin were detected. Low resistance of *H.influenzae* to tetracycline has been noticed for whole period of the study and high-resistance isolates to co-trimoxazole were dominated for ten-year period of the study.

INTRODUCTION:

H. influenzae is one of the most common bacterial pathogens in adults and children causing community-acquired respiratory tract infections. β-lactamase production is the most common resistance mechanism of *H. influenzae*.

PURPOSE:

To investigate the antimicrobial resistance of clinical strains *H. influenzae* isolated in adults and children in various regions of Russia Federation during ten years period (2004-2013).

Antimicrobial	I,% 2004-2005 (n=258)	R,% 2004-2005 (n=258)	I,% 2006-2009 (n=369)	R,% 2006-2009 (n=369)	I,% 2010-2013 (n=110)	R,% 2010-2013 (n=110)
Amoxicillin	0	5.4	0	2.7	0	10.0
Amoxicillin/clavulanic acid	0	1.5	0	0.3	0	0.9
Ceftriaxone	0	0	0	0	0	3.6
Levofloxacin	0	0	0	0	0	0
Moxifloxacin	0	0	0	0	0	0
Tetracycline		5	0,5	2.4	0	1,8
Co-trimoxazole	6.6	23.3	6.9	28.9	2.7	30.9
Chloramphenicol	0	4.6	0	2.2	0	1.8

METHODS:

This study was conducted in different cities of Russia in 2004-2013. The centers are presented on fig1.

Fig. 1. Distribution of centers participated in the study

RESULTS:

A total 737 of non-duplicated strains of *H. influenzae* were isolated from patients with pneumonia, meningitis, acute otitis media, sinusitis, exacerbation of chronic bronchitis The majority of strains were isolated from respiratory samples. Clinical specimens from which *H. influenzae* have been isolated are presented in Fig. 2.

Generally, it would be noted that the resistance rate of *H.influenzae* to tested antimicrobials remained comparatively low. Resistance level to amoxicillin increased from to 5.4% 2004-2005 to 10% in 2010-2013. Amoxicillin/clavulanate, fluoroquinolones (levofloxacin, moxifloxacin) possessed excellent *in vitro* activity. There were detected non-susceptible strains to ceftriaxone (3.6%) in 2010-2013. Co-trimoxazole and chloramphenicol showed stable activity against *H.influenzae* for ten-year period.

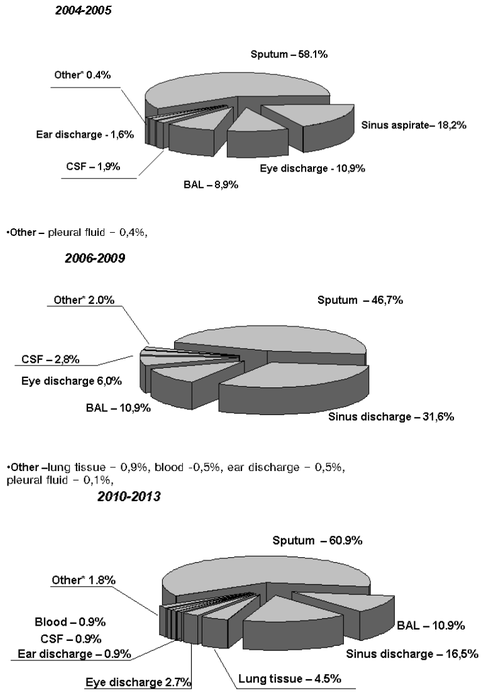
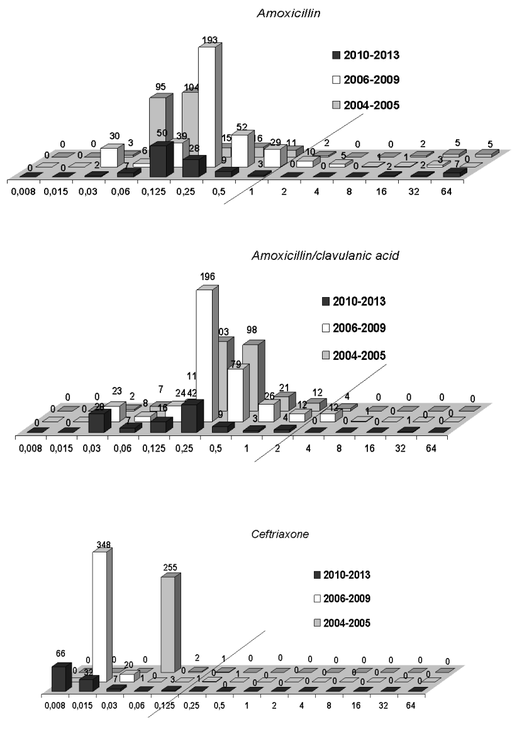


Fig. 2. Distribution of clinical specimens.

MIC distribution of *H.influenzae* are presented in Fig.3



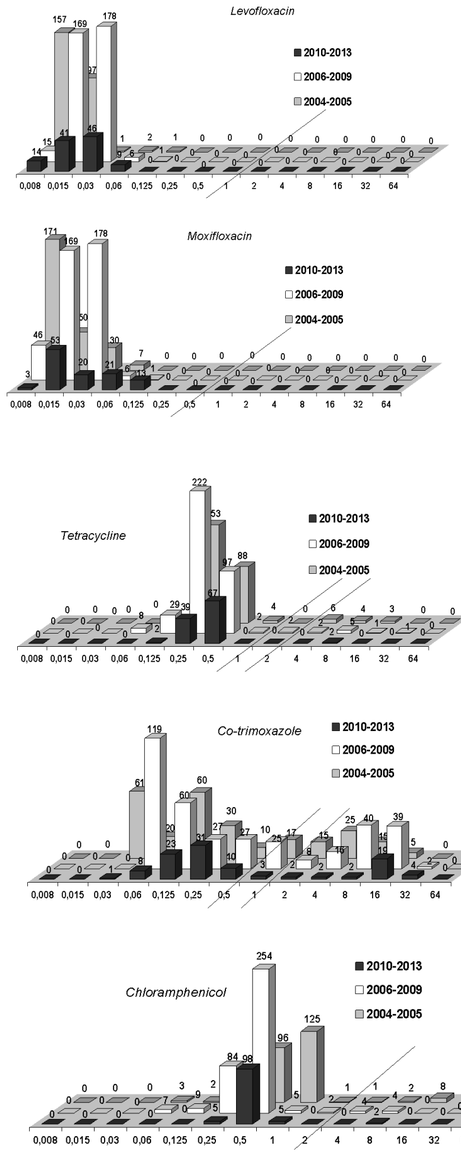


Fig. 3. MIC distribution for *H. influenzae.*

CONCLUSIONS:

All of *H.influenzae* isolated from various regions in Russia retain comparatively high susceptibility to tested antimicrobials.

The most active antimcirobials were amoxicillin/clavulanate and respiratory fluoroquinolones.

Co-trimoxazole possessed the lowest *in vitro* activity against tested isolates.

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