

TEN-YEAR SURVEILLANCE OF ANTIMICROBIAL RESISTANCE OF *S. PYOGENES* IN RUSSIA

Kozlov R., Sivaya O. Sukhorukova M., Ivanchik N., Kuzmenkov A. and PEHASus project group, Smolensk State Medical University, Smolensk, Russia

Background. To study the antimicrobial resistance of *Streptococcus pyogenes* in different regions of Russia from 2004 to 2013.

Methods. Clinical isolates of *S. pyogenes* have been collected for ten years and stored in the central laboratory of Institute of Antimicrobial Chemotherapy in Smolensk at -70°C. MALDI-TOF MS (Microflex-LT, Biotyper System, Bruker Daltonics, Germany) was 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 1094 of non-duplicated isolates of *S. pyogenes* were enrolled in the study for ten-year period (2004-2013). The susceptibility testing results (I/R, %) are presented in the Table.

	I,%	R,%	I,%	R,%	I,%	R,%
Antimicrobial	2004-2005 (n=373)		2006-2009 (n=575)		2010-2013 (n=146)	
Penicillin	0	0	0	0	0	0
Erythromycin	4	4.8	0.4	3	0.7	5.5
Azithromycin	2.7	9.6	1.9	11	2.1	4.1
Clarithromycin	1.6	2.9	2.1	3.3	2.1	3.4
Clindamycin	0	0.3	0	0.9	0	0
Tetracycline	0.8	47.2	3	39	1	27.4
Chloramphenicol	0	12.6	0	12.5	0	8.9
Co-trimoxazole	0	0.3	0	0	0	0

Conclusions. No resistance of *S. pyogenes* to β-lactams has been detected. Macrolides and clindamycin have shown high *in vitro* activity against all tested isolates. Tetracycline has been poorly active against *S. pyogenes* and therefore it should be avoided in clinical practice.

OBJECTIVE

S. pyogenes (GAS) is the one of the common bacterial pathogens causing tonsillopharyngitis, sinusitis and acute otitis media, skin and skin structure infections. In addition there can cause toxic stroke syndrome and also both non-infectious (e.g. acute rheumatic fever, glomerulonephritis) and infectious complications. For long time penicillin was the first choice for treatment of those infections. But taking into account there are people with contraindications for penicillin it is extremely significant to know GAS resistance to macrolides.

PURPOSE

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

METHODS

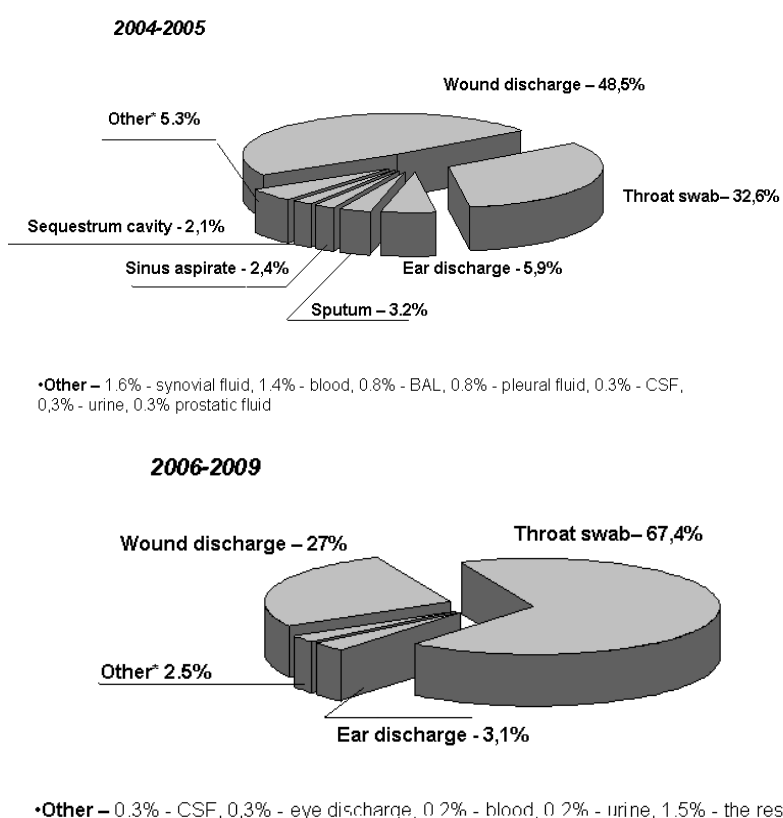
This study was conducted in different cities of Russia in 2004-2013. The centers are presented on fig 1.



Fig. 1. Distribution of centers participated in the study

RESULTS

A total of 1,094 non-duplicate clinical isolates of *S. pyogenes* were included in this study. There were collected 373, 575 and 146 strains of *S. pyogenes* in 2004-2005, 2006-2009 and 2010-2013 respectively. The majority of the strains were isolated from respiratory and wound samples. Clinical specimens are presented in Fig. 2.



*Other – 0.3% - CSF, 0.3% - eye discharge, 0.2% - blood, 0.2% - urine, 1.5% - the rest

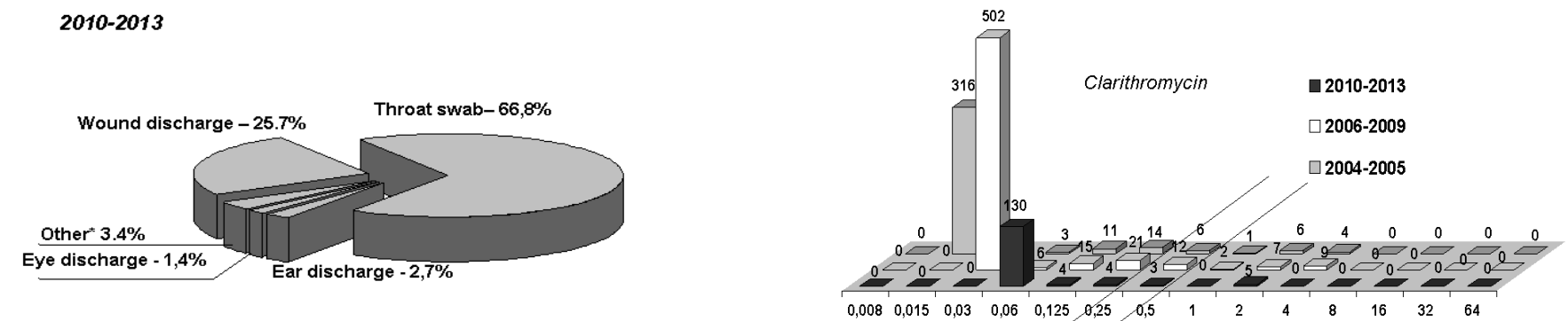
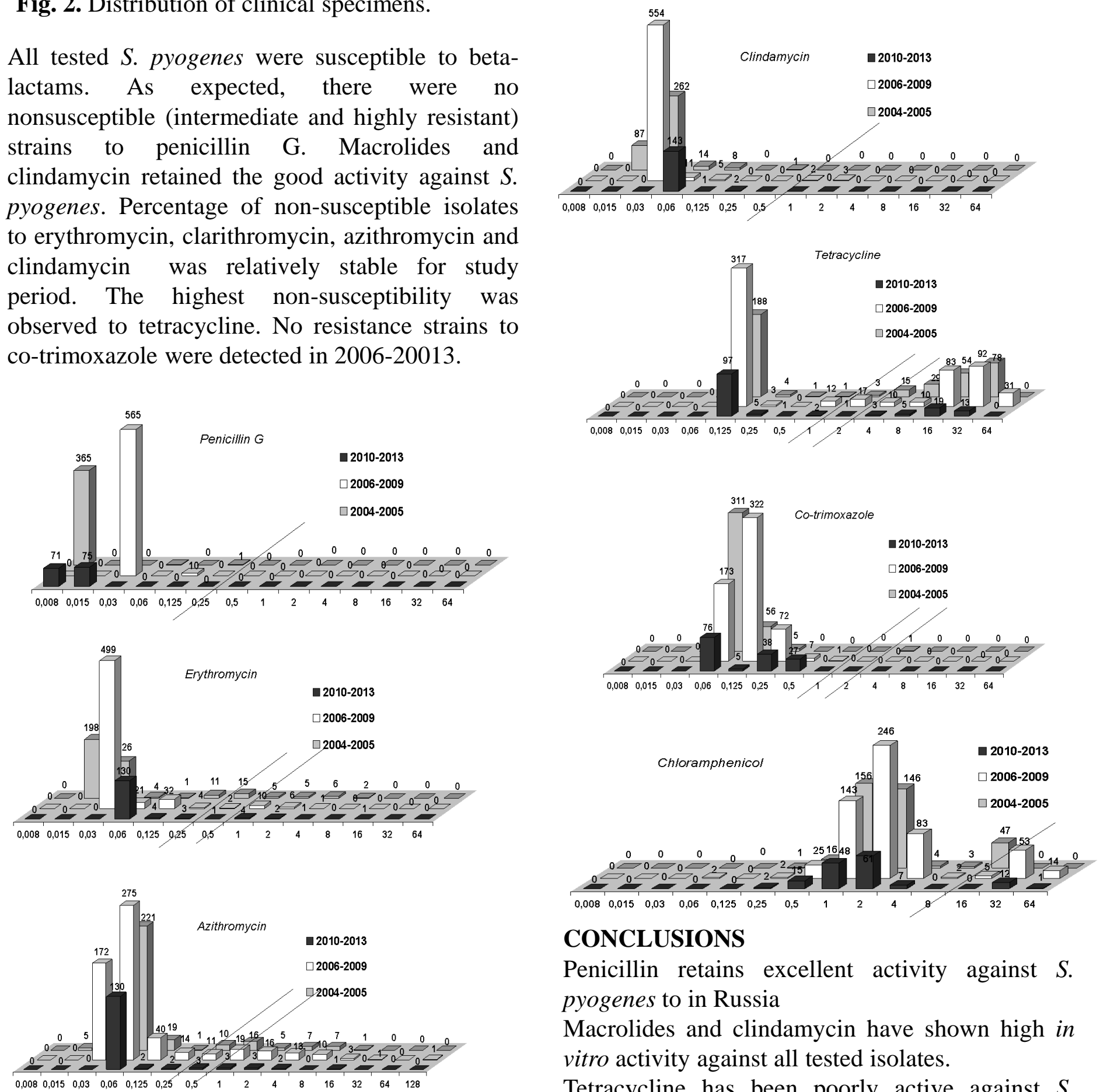


Fig. 2. Distribution of clinical specimens.

All tested *S. pyogenes* were susceptible to beta-lactams. As expected, there were no nonsusceptible (intermediate and highly resistant) strains to penicillin G. Macrolides and clindamycin retained the good activity against *S. pyogenes*. Percentage of non-susceptible isolates to erythromycin, clarithromycin, azithromycin and clindamycin was relatively stable for study period. The highest non-susceptibility was observed to tetracycline. No resistance strains to co-trimoxazole were detected in 2006-20013.



CONCLUSIONS

Penicillin retains excellent activity against *S. pyogenes* in Russia. Macrolides and clindamycin have shown high *in vitro* activity against all tested isolates. Tetracycline has been poorly active against *S. pyogenes* and therefore it should be avoided for usage in clinical practice.