

## A COMPARATIVE STUDY ON THE SENSITIVITY OF STAFYLOCOCCUS AUREUS TO ANTIBIOTIC DRUGS

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Minimum inhibitory concentration (MIC) of the antibiotics Pn, Oxi, Am, Amx, Cfp, Cfl, Cft, Gm, Sm, Km, Tc, T, R, and the fluoroquinulins E,N,C were determined in 94 Staph. aureus strains isolated from women with vaginitis, cows with acute endometritis and subclinical mastitis and goats with subclinical mastitis. The resistance to penicillin is 100% and to tetracyclin and tylosin is 60-70%. Staphylococci isolated from women are resistant to large number of antibiotics.

The strains isolated from both animals and women are however highly sensitive to cephalotriaxon, gentamicin and fluoroquinulins, with MIC from 0.5 to 4µg/ml.

### INTRODUCTION

*Staphylococcus aureus* is the main causative agent of subclinical and clinical mastitis, endometritis, vaginitis and hospital infections in humans (3,9,10,11). The medications of the purulent diseases caused by resistant *Staphylococcal* strains is not very effective in the last decade (7, 11), particularly after the appearance of strains resistant to wide spectrum of therapeutic drugs (1, 2, 7). It was established that the selection of the resistant variants of *Staphylococci* is accompanied with increased production of  $\alpha$ -hemolysin which caused lysis of the endothelial cells (12) and with rise in their virulence. Many authors have noticed strong resistance of *Staphylococci* to the traditional therapeutic drugs (2,4,10). The hope is that the medication will be more effective when using cephalosporins, aminoglycosides and fluoroquinulins. It is however possible that the *Staphylococci* might gain resistance to these new drugs (5). This motivated us to investigate the drug resistance of *Staph. aureus* strains isolated from animals and women with infections of genitalia and mammary gland.

### MATERIAL AND METHODS

A total of 94 *Staphylococcus aureus* strains were isolated from women with vaginitis, cows with acute endometritis or with subclinical mastitis and goats with light forms of

subclinical mastitis. The primary isolation was made on meatpeptone agar supplemented with 5% sheep blood. The Staphylococci were identified after Bergly,s Manual (8) and their sensitivity was tested to penicillin (Pn), oxacillin (Oxi), ampicillin (Am), amoxicillin (Amx), cefapirin (Cfp), cefalexin (Cfl), ceftriaxon (Cft), gentamycin (Gm), streptomycin (Sm), kanamycin (Km), tetracyclin (Tc), tylosin (T), rifamycin (R), entrofloxacin (E), norfloxacin (N), ciprofloxacin (C) by two-fold serial dilution (6).

## RESULTS AND DISCUSSION

The number of the resistant Staphylococcal strains is given in table 1. Data indicate that most of them are resistant to penicillins and that the resistance is higher to tetracyclin and tylosin than to ampicillin, amoxicillin and cephapirin. This has been demonstrated also by other autors (2,4, 10). The strains isolated from women are more resistant to wide spectrum of antibiotics than those isolated from animals. Similarly the number of the resistant strains isolated from goats with mastitis is higher than those isolated from cows. At the same time, however, all those Staphylococcal strains are highly sensitive to cephalosporins, gentamicin and fluoroquinolones with MIC from 0.5 to 4 µg/ml. The results indicate that these drugs can be used for medication of purulent diseases of the reproductive tract. Control for eventual development of resistance is required(5).

MIC (µg/ml)	D r u g s																	
	Pn	Oxi	Am	Amx	Cfz	Cfp	Cfl	Cft	Tc	T	Gm	Sm	Tb	E	N	C		
0.5																	18	
1								34									28	58
2								51			15		48	56	68	47		
4				10				16			47		51	41	27			
8			18	21			12	22			61		10	26				
16			45	53	45	42	53		11			18	14					
32			41	27	53	61	50		70	71		51						
>32	123	123	19	12	25	20	8		42	52		54						

Table 1. Minimal inhibitory concentration (MIC) of *Staphylococcus sp.* to drugs and number of sensitive strains.

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## КОМПАРАТИВНО ПРОУЧУВАЊЕ НА ОСЕТЛИВОСТА НА STAPHYLOCOCCUS AUREUS НА АНТИБИОТИЦИ

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Беше утврдена минимална инхибиторна концентрација (МИК) на антибиотиците Рп, Охi, Ам, Амх, Сфр, Сп, Сф, Гм, См, Кт, Тс, Т, Р, и флуороквинулините Е, N, С, во 94 соеви Staph. aureus изолирани од жени со вагинитис, крави со акутен ендометритис и субклинички маститис и кози со субклинички маститис. Отпорноста на пеницилин е 100% ,а на тетрациклин и тилозин е 60-70%. Стафилококите изолирани од жените се отпорни на голем број на антибиотици.

Соевите кои беа изолирани и од животните и од жените беа високо осетливи на цефелотриаксон, гентамицин и флуороквинилините, со МИК од 0.5 до 41 g/ml.