

Prevalence of Multiple Antibiotic Resistant Nasal Carriage MRSA Among Healthy Population of Border Villages in Amritsar Region, Punjab, India

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Sir,

Staphylococcus aureus is a pathogen of immense concern because of its intrinsic virulence and knack to cause varied array of life-ominous circumstances, while adaptability to dissimilar ecological conditions [1]. Methicillin resistant *S. aureus* (MRSA) was firstly reported in 1960 from South-eastern England sanatoriums, whereas in 1982, community- acquired MRSA was reported from drug abusers and non-drug abusers in USA [2,3]. Extreme severity of drug-trafficking as well as social factors such as health and education also worsen Indo-Pak border (Radcliffe line) residents' lives which usually remain unreported [4]. In light of these references current study aims to assess the multiple antibiotic resistant MRSA from the anterior nares of healthy inhabitants at border villages of Amritsar province.

Multistage sampling procedures under surveillance of Gram Sarpanch (Village Head) (This is epidemiological study and according to ICMR ethical guidelines it would be necessary to have the consent of the community, which can be done through village leader) were made in prior sampling; excluding the anthology of subjects under prescription of any antibiotic intakes were used for sample compilation. There were total 9 blocks in the district and three blocks were in the border side, from the entire border county, two blocks were arbitrarily selected and the catalogues of two villages were framed out having the population of between 900-1100. Sampling was conducted on 10% of the population at each village, comprises of entire 400 nasal samples from the able-bodied subjects. Nasal swabs were collected from the anterior nares of both the nostrils with sterile cotton swab sticks (Hi-Media, Mumbai) pre dipped in 10% NaCl solution. The primary cultures were inoculated and incubated overnight at 37°C ((Mannitol salt agar (Hi-Media, Mumbai)). From each plate a Gram positive cocci bunches were identified by Gram staining and thereafter biochemical trials

such as mannitol broth fermentation, trehalose sugar fermentation, tube coagulase, DNase, beta haemolysis on sheep blood agar (Hi-Media, Mumbai) were executed. An entirety 24 (6%) nasal carriage *S. aureus* was isolated in this study. Demographic characteristics and drug resistance were compared with the employ of Chi-square and Fisher's-exact test (two-tailed) using GraphPad Prism (version 5). The p-value of ≤ 0.05 was considered to be statistically momentous. The nasal carriage *S. aureus* was 13 (54.17%) in males and 11 (45.83%) in females. Nasal carriage *S. aureus* was recorded in the unlike age factions as followed: 8 (33.33%), 7 (29.17%), 6 (25%), 3 (12.50%) in 25-31 years, 18-24 years, 32-38 years and 39-45 years, respectively. No consequential differences resulted between male and female at any age groups ($p > 0.05$). All the isolates were tested and incubated (at 37°C) against 9 dissimilar antibiotics discs (Hi-Media, Mumbai) viz. penicillin (10units), oxacillin (1µg), cefoxitin (30µg), gentamicin (10µg), amikacin (30µg), erythromycin (15µg), tetracycline (30µg), ciprofloxacin (5µg), and clindamycin (2µg). Results were interpreted according to CLSI [5]. *S. aureus* resistant to oxacillin, cefoxitin and oxacillin screening agar (Hi-Media, Mumbai), incubated at 35°C were considered as MRSA, according to CLSI guidelines [5]. ATCC 25923 *S. aureus* was used as reference strain. The prevalence of nasal carriage MRSA is 4.5% (18/400) which is almost double in comparison to the previous study done on Kashmiri village's population 1.83% (15/820) by Fomda and group [6]. Out of 18 MRSA isolates, 10 (55.56%) are detected in males and 8 (44.44%) in females, that is approximately in agreement with study conducted by Fomda et al., [6]. Antimicrobial susceptibility pattern also demonstrates that the resistant rate to both erythromycin (4.1%) and clindamycin (4.1%) among our community- acquired MRSA is low and contradict with previous study reporting higher resistance rate to both erythromycin (26.7%) and clindamycin (33.3%) [6]. Resistance to tetracycline and ciprofloxacin is greater and highly significant for MRSA when compared to MSSA [Table/Fig-1] that might be as a result of their uncontrolled usage in the community. Our results are indicating dire need to improve personal sanitation in the borders areas and scrutiny at various echelons in different regions to tackle higher level community snags.

REFERENCES

- [1] Lowy FD. *Staphylococcus aureus* infections. *N Engl J Med*. 1998;339:520-32.
- [2] Jevons MP. "Celbenin"- resistant *Staphylococci*. *Br Med J*. 1961;1:124.
- [3] Saravolatz LD, Markowitz N, Arking L, Pohlod D, Fisher E. Methicillin- resistant *Staphylococcus aureus*: epidemiologic observations during a community-acquired outbreak. *Ann Intern Med*. 1982;96(1):11-16.
- [4] Singh K, Rangnekar US. A profile Report on Pre- Project Survey of Border Area Development Programmes in Punjab Annexure - VI. Available from: <http://pbplanning.gov.in/pdf/annexure-vi.pdf> [Last accessed on 2014 Oct 20].

Antibiotics	MSSA		MRSA		p-value
	Sensitive	Resistant	Sensitive	Resistant	
Gentamicin	4(16.6)	1(4.1)	6(25)	7(29.1)	0.313
Tetracycline	2(8.3)	0(0)	1(4.2)	11(45.8)	0.033
Ciprofloxacin	4(16.6)	1(4.1)	2(8.3)	10(41.6)	0.027
Penicillin	0(0)	6(25)	0(0)	18(75)	-
Amikacin	6(25)	0(0)	11(45.8)	4(16.6)	0.280
Erythromycin	5(20.8)	0(0)	8(33.3)	1(4.1)	1
Clindamycin	2(8.3)	2(8.3)	8(33.3)	1(4.1)	0.202
Oxacillin	4(16.6)	0(0)	0(0)	18(75)	-
Cefoxitin	6(25)	0(0)	0(0)	18(75)	-

[Table/Fig-1]: Antibiotic susceptibility of *S. aureus* isolates (n=24).

- [5] Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing; Twenty-First Informational Supplement. CLSI document M100-S21. Wayne, PA: 2011.
- [6] Fomda BA, Thokar MA, Khan A, Bhat AJ, Zahoor D, Bashir G, et al. Nasal carriage of Methicillin- resistant *Staphylococcus aureus* among healthy population of Kashmir, India. *Indian J Med Microbiol.* 2014;32(1):39-43.

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