DOI: 10.7860/JCDR/2017/27677.10344

Letter to Editor

Microbiology Section

Decline of Nosocomial Methicillin-Resistant *Staphylococcus aureus* Skin and Soft Tissue Infections in an Indian Tertiary Hospital: Hope for the Future

ROJALEEN DAS[1], SUJEESH SEBASTIAN[2], ARTI KAPIL[3], BENU DHAWAN[4]

Keywords: Antimicrobial resistance, Antimicrobial stewardship programme, Superbug

Dear Editor,

Methicillin-Resistant *Staphylococcus aureus* (MRSA) is an important cause of nosocomial infection including Skin and Soft Tissue Infections (SSTIs). After the introduction of MRSA in the United Kingdom in 1961, MRSA became a hospital superbug throughout the world. However, recent data from both Northern America and Europe [1,2], indicates a decrease in MRSA prevalence since beginning of 2010.

At the All India Institute of Medical Sciences (AIIMS), a 3000 bedded tertiary care hospital, the prevalence of antimicrobial resistance is extremely high across both Gram-positive and Gram-negative bacterial genera due to the immense antibiotic pressure [3]. The last study on the prevalence of MRSA in SSTIs at AIIMS was conducted during the period 2005-2007 and showed a rate of 41.3% [4].

The objective of this study was to determine the current prevalence rate of nosocomial MRSA in SSTIs at our hospital. This analysis of methicillin resistance rates was intended to determine whether the MRSA prevalence in India mirrors the decline in MRSA infection being observed in many countries worldwide.

We studied the strain of *S. aureus* isolated from inpatients with SSTIs between January 2016 and December 2016. *S. aureus* SSTI was defined as a case associated with isolate of pure growth of *S. aureus* from a soft tissue specimen. A nosocomial case was defined as a patient without any evidence of infection on admission, who was culture positive >48 hours after admission. The isolates included in our study were nosocomial *S. aureus* causing SSTI. The *S. aureus* isolates acquired from community (i.e., cases with SSTI at time of admission or presenting within 48 hours) and/or presenting as a polymicrobial infection were excluded from the study. All staphylococci were identified by standard biochemical tests and susceptibility to oxacillin was determined using the cefoxitin (30 µg) disc diffusion method [5].

A total of 479 nonduplicate *S. aureus* isolates were obtained from 6572 skin and soft tissue specimens received in the clinical bacteriology laboratory during the study period. The overall prevalence of MRSA was 22.3% (107/479). The isolation rate of MRSA from various specialities was; surgical units 64.5%, medical units 26.2% and intensive care units 9.3%. The resistance rates of the MRSA isolates to amikacin (30 µg), ciprofloxacin (5 µg), erythromycin (15 µg) and rifampicin (5 µg) were 68.2% (73/107), 80.3% (86/107), 44.8% (48/107) and 1.8% (2/107) respectively. All MRSA isolates were uniformly susceptible to vancomycin (30 µg), linezolid (30 µg) and teicoplanin (30 µg). We observed a significant decline in nosocomial MRSA SSTIs from 38.5% in 2002 [6] and 41.3% in 2005-2007 [4] to 22.3% in 2016 (p-value=0.01). The decline in the rate of MRSA in our patients is consistent with that in many regions of the world. Olearo F et al., reported an overall decrease in the proportion of MRSA among *S. aureus* invasive and non invasive isolates from 2004 to 2014 [1]. The incidence of MRSA in surgical site infections in a study from West Bengal [7] declined by 15.17% in 2017 compared to 2009. The cause of decline of MRSA is likely to be multi-factorial. Our hospital has an active infection prevention and control programme including well-established hand hygiene, standard precautions training programme and an antimicrobial stewardship programme.

Limitations of our study include the retrospective laboratory record review methods and collection of data from one hospital only. Also, we did not have molecular epidemiology analysis at our disposals hence, requiring us to depend on the phenotypic definition of nosocomial MRSA. Nonetheless, this initial data mirrors the downward trends of nosocomial MRSA infection being observed worldwide which are reflective of the successful efforts of the medical community to control this superbug. To conclude, effort to combat MRSA and its possible extinction requires strategic, co-ordinated and sustained infection prevention and control measures.

REFERENCES

[1] Olearo F, Albrich WC, Vernaz N, Harbarth S, Kronenberg A. *Staphylococcus aureus* and methicillin resistance in Switzerland: regional differences and trends from 2004 to 2014.Swiss Med Wkly. 2016;146:w14339.
[2] Boyce JM, Cookson B, Christiansen K, Hori S, Vuopio-Varkila J, Kocagöz S, et al. Meticillin-resistant *Staphylococcus aureus*. Lancet Infect Dis. 2005;5:653–63.
[3] Joshi S, Ray P, Manchanda V, Bajaj J, Chitnis DS, Gautam V, et al. Methicillin resistant *Staphylococcus aureus* (MRSA) in India: prevalence & susceptibility pattern. Indian J Med Res. 2013;137:363-69.
[4] Gadepalli R, Dhawan B, Kapil A, Sreenivas V, Jaisc M, Gaind R, et al. Clinical and molecular characteristics of nosocomial meticillin-resistant *Staphylococcus aureus* skin and soft tissue isolates from three Indian hospitals. J Hosp Infec. 2009;73:253-63.
[5] Clinical and Laboratory Standards Institute (CLSI). Performance standards for antimicrobial susceptibility testing, 26th edition. Wayne PA: CLSI; 2016.
[6] Mohanty S, Kapil A, Dhawan B, Das BK. Bacteriological and antimicrobial susceptibility profile of soft tissue infections from Northern India. Ind J Med Sci. 2004;58:10-15.
[7] Bhattacharya S, Pal K, Jain S, Chatterjee SS, Konar J. Surgical site infection by methicillin resistant *Staphylococcus aureus*– on decline? Journal of Clinical and Diagnostic Research. 2016;10(9):DC32-DC36.

PARTICULARS OF CONTRIBUTORS:
1. Senior Resident, Department of Microbiology, All India Institute of Medical Sciences, Ansari Nagar, Delhi, India.
2. Ph.D Scholar, Department of Microbiology, All India Institute of Medical Sciences, Ansari Nagar, Delhi, India.
3. Professor, Department of Microbiology, All India Institute of Medical Sciences, Ansari Nagar, Delhi, India.
4. Professor, Department of Microbiology, All India Institute of Medical Sciences, Ansari Nagar, Delhi, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Benu Dhawan,
Professor, Department of Microbiology, All India Institute of Medical Sciences, Ansari Nagar, New Delhi-110029, India.
E-mail: dhawanb@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Feb 17, 2017**
Date of Peer Review: **Apr 20, 2017**
Date of Acceptance: **Apr 29, 2017**
Date of Publishing: **Aug 01, 2017**