FREQUENCY OF MRSA IN PATIENTS PRESENTING WITH RECURRENT SKIN INFECTION IN SKIN UNIT HAYATABAD MEDICAL COMPLEX (HMC) PESHAWAR

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ABSTRACT

Objective: To compare frequency of Methicillin Resistant Staphylococcus aureus (MRSA) between outdoor and admitted patients with recurrent skin infections in patients presenting to skin unit ,Hayatabad Medical Complex Peshawar.

Material and Methods: This Cross Sectional analytical study was conducted in Dermatology Unit of Hayatabad Medical Complex and Pathology Department, Khyber Teaching Hospital, Peshawar. This research was completed within the period of 06 months i.e. from mid of March 2015 to mid of September 2015. Non-probability sampling technique was used for the purpose of data collection.

Results: In the present study 100 cases of different dermatological diseases with superadded bacterial infections were enrolled in Dermatology unit of HMC Peshawar. Out of 100 specimens 50 were collected from patients admitted in skin ward while 50 from skin OPD. Total of 82% (82/100) patients with Staph aureus isolates identified. The collected data was analyzed through a computer software SPSS, version 19.

Conclusion: Staphylococcus aureus continues to be a dangerous pathogen for both community (general population) as well as hospital staff. MRSA infections are increasing in general populations and also in admitted patients in skin unit of HMC. There is also increased incidence of morbidity and high ratio of mortality in these patients due to MRSA infections.

Key Words: MRSA (Methicillin Resistant Staphylococcus aureus), Recurrence, Skin Infection

INTRODUCTION

MRSA (Methicillin Resistant Staphylococcus aureus) is an important nosocomial pathogen in all over the world. Staphylococcus aureus when the strain is MRSA are mostly involved in skin and soft tissues infections with invasive manifestations have a worst and poorer prognosis. There are two types HA-MRSA and CA-MRSA.

Resistant strains of Staphylococcus aureus to Methicillin and Oxacillin antibiotics were reported initially in 1960s called MRSA and ORSA[1]. In recent time Methicillin Resistant Staphylococcus aureus (MRSA) recognized globally as an important pathogens causing community and nosocomial infections due to community acquired Methicillin Resistant Staphylococcus aureus (CA-MRSA) and hospital acquired (HA-MRSA) respectively[2]. Staphylococcus aureus and MRSA are most common pathogens among the Gram-positive organisms involved in skin and soft tissue infections (SSTI)[17]. Wound and skin infections due to these nosocomial pathogens particularly MRSA are associated with extremely high ratio of patients morbidity and mortality. To prevent and decrease these infections and their fatal consequences are challenging task to physicians and surveillance authorities[3]. Factors contributing to MRSA and other nosocomial infections are immune compromising state due to any reasons, irrational use of antimicrobial drugs, and prolonged hospitalisation[4,5].

MRSA (Methicillin Resistant Staphylococcus aureus) causing different Skin and soft tissue infections include, impetigo: erythematous skin lesions around the mouth and nose that progress into bullae when rupture a honey-colored crust forms called impetigo. Staphylococcal Scalded skin syndrome also called Ritter disease: A toxin-mediated disorder with surface blisters when rupture, leaving painful base accompanied by mucopurulent eye discharge. Cellulitis: infection of dermis and subcutaneous tissues of skin. Infected eczema: inflammatory skin condition with superadded bacterial infection. Folliculitis: Bacterial Infection of hair follicle

Furuncle: Small abscesses with purulent discharge from a single opening in skin and the subcutaneous tissues having hair follicles. Carbuncle: Involvement of large skin area with aggregate of connected furuncles, and many pustular openings.

Osteomyelitis (Bone infections), Septic arthritis, Endocarditis, Toxic shock syndrome, Pneumonia, Thrombophlebitis and deep tissue abscess and muscles infection.[6,7,8,9]

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Different organs of body can be infected with MRSA including the, liver, spleen, kidneys, parotid gland, eyes and central nervous system secondary to deep tissue abscesses[10,11].

MATERIAL AND METHODS

This Cross Sectional analytical study was conducted in Dermatology Unit of Hayatabad Medical Complex and Pathology Department, Khyber Teaching Hospital, Peshawar. This research completed within the period of 06 months i.e. from the mid of March 2015 to the mid of September 2015. Non-probability sampling technique was used for the purpose of data collection. 100 Patients presenting with recurrent skin infections in outpatient (OPD) and and admitted patient in skin unit HMC Peshawar, were contacted for the purpose of data collection. The data was analyzed in SPSS version 19.

DATA COLLECTION PROCEDURE

Processing of specimen:

Isolation of MRSA: Blood agar, chocolate agar and Mannitol Salt agar (MSA) were used to inoculate the samples and incubated at 37°C for overnight. While S. aureus growth was identified on Gram staining, biochemical characteristics and culture growth.

Using standard microbiological procedures two to three colonies of bacterial growth mix with distilled water in 5ml ampoule. Mueller Hinton agar plate was used for Inoculation which is spread uniformly based on McFarland standard. Antibiotics Cefoxitin (30 mcg), were placed on plates, incubated at 37°C for 18-24 hours. Zones of inhibition were measured with a caliper if it is less than 22mm then according to CLSI recommendations the bacterium labeled as resistant to FOX antibiotics means MRSA[12].

DATA ANALYSIS / RESULTS

In the present study 100 cases of different dermatological diseases with superadded bacterial infections were enrolled in Dermatology unit of HMC Peshawar. Out of 100 specimens 50 were collected from patients admitted in skin ward while 50 from skin OPD. Total of (82/100) 82% patients with Staph aureus isolates identified. Among these (47/82) 57% isolates were MRSA positive and (35/82) 43% were MSSA. The number of MRSA isolates in admitted patients were (39/47) 83% and in OPD patients were (8/47) 17%. Age wise distribution among 100 patients was analyzed as 9/47(19%) were found MRSA positive in their specimens in age group <20 years, while number of MRSA positive samples were 11/47(23%) in age group between 21-50 years and 27/47(58%) patients were found MRSA positive in age group above 50 years. Gender wise MRSA distribution was analyzed among outdoor and admitted patients, pus and wound swab specimens collected from male and females patients visited to skin unit HMC. There

Table No. 01

Total No. of Patient	Admitted in skin ward	OPD out patients)
100	50	50

Table No. 02

Staph aureus isolates	Wards (N=50)	OPD (N=50)
82	45	37

Table No. 03

Distribution	Total number	Percentage
MRSA	47	57%
MSSA	35	43%
Ward	39	83%
OPD	08	17%

Table No. 04: Age Wise Distribution

Age group	No. of MRSA positive cases	Percentage
Less than 20 years	09	19 %
21-50 years	11	(23 %)
Above 50 years	27	(58%)

Table No. 05 Gender wise MRSA distribution

Gender	Number of MRSA cases	Percentage
Male	36	77%
Female	11	23%

Table No. 06 MRSA distribution in Diabetic patients

Distribution	Total No. of patients	MRSA positive cases	Percentage
Diabetic	24	18	75%
Non-Diabetic	76	29	38%

were 61/70(87%) staph aureus isolates and 36/61(59%) were positive for MRSA and 25/61(41%) were MSSA. The prevalence of MRSA among males was 36/47(77%) and in females was 11/47(23%).

Among these patients 18/100(18%) were diabetics in which 13/70(19%) were male and 5/30(17%) were females. The prevalence of MRSA in patients with diabeties malitus having recurrent pyogenic skin

infections was 13/18 (72%), in which 9/13(69%) were male and 4/5 (80%) were females.

DISCUSSION

Staphylococcus aureus continues to be a dangerous pathogen for both community-acquired as well as hospital-associated infections. Methicillin Resistant Staphylococcus aureus (MRSA) was first reported in October 1960[24].

With the introduction of MRSA steady rise occur in the number of S. aureus isolates in different hospitals. Study in 1975 to 1991 by National Nosocomial Infections surveillance, reported 2.5% to 29% rise of MRSA infections. Many other studies also have been carried out on frequency of MRSA among other nosocomial infections.[11]

In the present study 100 cases of different dermatological diseases with superadded bacterial infections were enrolled. Out of 100 specimens 50 were collected from patients admitted in skin ward while 50 from skin OPD. Total of (82/100) 82% patients with Staph aureus isolates identified. Among these (47/82) 57% isolates were MRSA positive. The number of MRSA isolates in admitted patients were (39/47) 83% and in OPD patients were (8/47) 17%. Age wise distribution among 100 patients was analyzed as 9/47(19%) were found MRSA positive in age group <20 years, 11/47(23%) in age group between 21-50 years and 27/47(58%) patients were found MRSA positive in age group above 50 years. Gender wise MRSA distribution in male and females patients visited to skin unit HMC. The prevalence of MRSA among males was 36/47(77%) and in females was 11/47(23%).

Studies in developed countries of the world like UK, Spain, Italy and France shows 25% MRSA prevalence rate. Which is lower prevalence in comparison to our study, including Poland, Czech Republic and Australia 7% to 14%[15]. In Greece and in Japan the prevalence of MRSA is quite high unlike the other developed countries of the world ranging from 40% to 60%[16].

Figures in our study shows there were 82 staph aureus isolated from pus specimen in patient with recurrent skin and soft tissues infections both from in and out patient department of skin unit HMC. Among those 57% isolates were MRSA. While major portion of MRSA infections were detected in admitted and previously exposed patients. Also in our study the elder patient along with immune compromised state such as diebeties mellitus disease are having high prevalence as compared to young and immune competent individuals. The percentage of MRSA prevalence in skin infections of male compared to females are slightly high in this study. Comparative results were found in one study in India on pus samples according to prevalence of MRSA skin infections[19].

Frequency of MRSA infections is increasing in general population and also in admitted patients in different units of hospitals with acute minor and invasive infections. Recent studies in Europe shows, the major causative organism involved in SSTIs(skin and soft tissues infections) was Staphylococcus aureus which is (71% cases) with 22.5 per cent share of MRSA[17]. A wide variety in MRSA prevalence observed among different countries of Europe ranging from 0.4% in Sweden to 48.4% in Belgium[17]. Steady increase observed in overall incidence of Staph. aureus and MRSA infections during 10 years period in US, the infections ratio of MRSA in SSTI were specially part of those studies held in US[22]. In western side of India Methicillin resistant S. aureus (MRSA) prevalence are 25 percent which is considered to be low as compared to south india which is 50percent. In India MRSA infection is endemic due to variable incidence[25,26]. The rise in cases of Community associated MRSA (CA-MRSA) infections has been reported on daily bases in India[27]. In Delhi capital city of India the prevalence of MRSA varies from 7.5% to 41% between regions and different hospitals in the same region. The prevalence of MRSA varies in hospital associated skin and soft tissues infections between three tertiary care teaching hospitals of Delhi India[23].

Study shows 64.4% MRSA infections ratio in intensive care unit of US hospital in 2003.[13] There is also increase incidence of morbidity and high ratio of mortality in these hospitals due to MRSA infections,[14] increases costs of treatment and put economic burden on community and health system.[15,16]

CONCLUSION

Staphylococcus aureus continues to be a dangerous pathogen for both community (general population) as well as hospital staff. MRSA infections are increasing in general populations and also in admitted patients in skin unit of HMC. There is also increased incidence of morbidity and high ratio of mortality in these patients due to MRSA infections.

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