Original Article

A SUPERBUG (METHICILLIN RESISTANT STAPHYLOCOCCUS AUERUS) IN HUMAN

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ABSTRACT

OBJECTIVE:

To study incidence the (MRSA) methicillin resistance staphylococcus aureus in various surgical pathologies.

DESIGN:

Non probability random sampling.

PLACE & DURATION OF STUDY:

Study was conducted in Allied Hospital & Independent Hospital from March 2003 to Feb 2004.

RESULTS:

Total 340 randomly collected samples from patient were analysed for presence of MRSA. Of 340 samples 162 (47.53) were positive for S. aureus, of these 52.64 % (n = 85) were MRSA while resistance 47.5 (n = 77) were found to MSSA. Hospital based analysis showed that 58.64 (n = 95) and 41.51 (n = 67) percent. S. aureus respectively from AHF & IMC Hospital.

CONCLUSION:

Incidence of MRSA is acutely high in our hospitals. The highest no of MRSA were isolated from wound samples.

KEY WORDS:

MRSA (methicillin resistant staphylococcus aureus).
MSSA (methicilline sensitive staphylococcus aureus

INTRODUCTION:

Methicillin Resistant Staphylococcus Auerus (MRSA) is a leading Bacterial pathogen involved in a number of epidermics all over the world. This organism is responsible for health problems in 1.7 million American per year and 99.000 deaths. Recently a report published by center for disease control Atlanta Georgia, USA mentioned a significant decline in MRSA infections in hospitals. Such decreasing trend in MRSA infections are also being mentioned in some their countries partly because of active steps taken by the concerned authorities in the part to curtail MRSA infection including active bacterial core surveillance systems. However situation in developing nations is still grave concerning this pathogen, because of unawareness among health administrative departments and public, shortage of funds, lack of surveillance system and research concerning MRSA infections. Over the counter drugs including antibiotics on 24/7 basis to the public, self-medication, wide spread quackery and over prescription of antibiotics by the doctors to patients are an other causes of high infections rate. Very little work has been done in finding its incidence in hospitalized patients. This study is conducted to find out the frequency of this resistant organism in our set up.

MATERIALS AND METHODS:

The present study was carried out in allied hospital and independent medical collage hospital Faisalabad from March2003-Feb2004. Both of their hospital provides tertiary health care to peoples of Faisalabad and referred

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from in and around it. After prior informed consents, samples were taken from accidental and surgical wounds, intravenous, urinary catheters, burns, carbuncle, abscesses, diabetic foot and human nares. Using sterilized cotton tip swab (medipak) after collection, samples were set in cool box and transferred to the laboratory swab samples were processed according to the procedure described by Quinn etel. Samples were inoculated individually into staphylococcal enrichment broth (sodium chloride, mannitol and trypton) for 24 hours at 35 centigrade.

Following incubation, loopful of broth was streaked on quadrant of tryptose blood agar base (TBA) enriched with 7% defibrinated sheep blood, baired pasher supplemented with egg yolk telluritic agar and CHROM agar MRSA plates of aerobically for 36 hour at 37 centigrade. Colonies consistent with staphylococci (dark black on bp) were subjected to Gram staining and calalase reaction. Then they were sub cultured on blood agar plates for further identification. Further confirmation of S. aureus was reached by generating 7-digit numerical profile (biotyping) using a commercially available identification system for staphylococcal (api-staph) For MRSA identification isolates of S.aureus were checked by latex agglutination test for presence of penicillin binding protein 2a, resistance to oxacilline on Mueller Hinton agar plates by disc diffusion method and molecular detection of mec A gene.

All data were entered in SPSS .12 and analyzed.

RESULT:

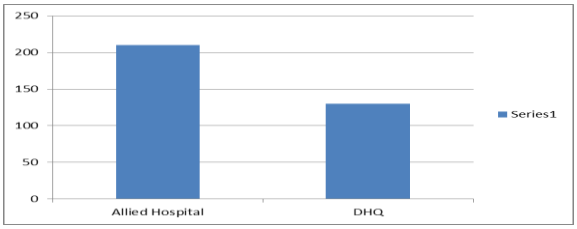
A total of 340 randomly collected samples from the patients were analyzed for the presence of methicillin resistant S.aureus of 340 samples 162 (47.53) were positive for S.aureus of these 52.64%(n=85) were MRSA while rest 47.5% (n=77) were found to be MSSA. Hospital based analysis showed that 58.64(n=95) and 41.5% (n=67) percent S.aureus respectively from AHF and IMC Hospital.

Among 85 patients 61.17% were labeled as hospital acquired HA MRSA and 38.82% as CA-MRSA community acquired MRSA. Major proportion (51.95%) of MSSA was recovered from accidental and surgical wounds followed by burns (15.58%) and diabetic foot (7.79%) (Table). Similarly among MRSA (n=85) from the two hospitals 48.24% were recovered from accidental and surgical wounds 15.29% from abscess, burns (11.76%), carbuncles 8.24% and diabetic and I/V catheter (7.06%) of samples (n=316) collected from individuals patients 61.39% (n=84) were from Allied Hospital and 38.61%(n=39) from IMC Hospital of these 38.9% were S.aureus nasal colonization of these 26(12.14) had MRSA.

AU (n=60) HA MRSA isolates were resistant to oxacillin, cefotaxime, pencillin and methicillin. However one isolates showed resistance to ampicillin. AU, HA, MRSA, isolates were found to be sensitive to vancomycin, linezolid, and teicoplantin.

The resistance was found to be 76.67%,81.66% and 76.67% against erythromycin, gentamicin and rifampicin respectively.

Distribution of samples from Allied Hospital and IDMC hospital.



Gender Total	Total Samples	Total MSSA	Total MRSA	Total MRSA	Total MRSA	Allied Hospital IDMC
MALE	213	64	71	50	21	71
FEMALE	127	13	15	6	09	15
TOTAL	340	77	85	55	30	86

Sampling site based on distribution of MRSA

Sample site	Allied Hospital	IDMC Hospital	Total	%age
Wound	27	14	41	48.24
Burn	7	3	10	11.76
Abscess	10	3	13	15.29
carbuncle	4	3	7	8.24
Diabetic foot	3	3	6	7.06
I/Vcanula	3	3	6	7.06
Urinary catheter	1	1	2	2.35
Total	55	30	85	

DISCUSSION:

Methicillin resistance staplylococeus auerus MRSA remains a major and persistant health problem worldwide. High and rising levels of MRSA have also been observed in patients in Pakistan.

Staph Auerus is frequently isolated as a part of human microflora causing various diseases, if Immune system is compromised. Anterior nares are the major reservoir in human. It is estimated that approximately 20% of healthy individuals are persistant carrier of S. auerus, whereas about 60% are intermittant carrier.

Since first report of methicillin resistant S. Aureus in 1961 in England. This organism has gradually acquired resistance to multiple antimicrobial agents. Majority of the infections by MRSA are reported in ICU in large tertiary care hospitals.

One study conducted by National Nosocomial infection surveillance system (NNIS) reported 60 % of isolated MRSA as hospital acquired worldwide the prevalence of MRSA continue to rise. The result of large surveillance in USA reported increase in MRSA rate from 22% in 1995 to 57% in 2001 which are compatible to our results. Another study conducted to calculate the over all prevalence of MRSA in hospital from all over the world between 1997 to 1999 reported 67% in Japan , 23 % in Australia, 40 % in south America, 20 % in Europe. In Pakistan, few studies reported the prevalence of MRSA in various hospitals and health care facilities Results are variable Hafiz et al in fall prevalence in Lahore while Siddiqi et al in 2009 reported in fall in prevalence about 34.8% in Lahore, while khalil and co-workers reported the highest incidence in gujrawala district of about 72.91% in 2001. But our study shows rising rate of resistance among S. aureus in Pakistan hospitals.

CONCLUSION:

Incidence of MRSA is quite high in our hospitals. The highest number of MRSA was isolated from the wound samples.

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