Nasal colonization of MSSA and MRSA, its impact to an Otolaryngology Practice

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Introduction

In the last twenty years Methicillin Resistant Staph. Aureus (MRSA) has spread throughout the world placing an increasing burden on the health care system. Healthcare-associated (nosocomial) subtype was thought to be responsible for MRSA infections, with only small numbers of community-associated cases [1,2]. However, in the last decade the community-associated type pathogen has become increasingly prevalent. Acquisition of MRSA colonization increases the risk for subsequent MRSA infections compared with non colonized individuals. Consequently nasal carriage of S. aureus may pose a serious threat to the present day surgical practice, due to increase incidence of postoperative infections. A pilot study was performed to analyze the prevalence and risk factors for S. aureus colonization in the anterior nose and also to review the potential impact of MRSA infections in ENT practice.

Methods and Materials

The study was conducted on the ambulatory patient population at St Luke’s-Roosevelt Medical Center, presenting with sino-nasal symptoms. A total 100 patients were enrolled in this pilot study. Under informed consent nasal cultures were obtained. In four confirmed S. aureus colonized patients nasal skin biopsy was performed during elective nasal procedure (SMR). All the related information regarding patient’s age, health status, frequency and reason for the clinic visits, and last date of hospitalization, significant medical history, antibiotic use and contacts with illness was gathered. History about any recent skin trauma, skin lesion, infection, tattooing or any drug use was also elicited. Culture method as standardized by hospital infection control group was used. The sterile swab was inserted into the anterior part of one nostril. The swab was then rotated three times, slowly and circumferentially around the internal nostril for 4-5 seconds, applying even pressure. The swab was removed, taking care not to touch anything else and returned back into its transport sleeve. Fig. 1. Patients with positive MRSA culture requiring hospitalization, intervention or surgical procedure were treated with Mupirocin ointment and Chlorhexidine washes. Mupirocin was applied twice daily for five days to anterior nares. Post treatment cultures were obtained one month later to confirm decolonization.

Results

In our study we found that around 40% of patients were colonized with MSSA (Methicillin Sensitive Staph. Aureus) and 4% with MRSA. Ages ranged from 10 to 72yrs. MSSA carriers were found to be younger (mean age 30) than non-colonized (mean age 35). By contrast MRSA colonization was more common in elderly. Three of the four MRSA carriers were over 65 years. S. aureus colonization was found to be higher in females as compared to males (MRSA had 75% of females, MSSA had 62% of females). Non-colonized population had even sex distribution. About half of the colonized patients in either group had no apparent risk factors.

Discussion

MRSA is an isolate of the bacterium Staphylococcus aureus that has acquired genes encoding antibiotic resistance to all penicillins, including methicillin and other narrow-spectrum β-lactamase-resistant penicillin antibiotics. Patients carrying MRSA can be split into two groups; those who are colonized and those who are infected. Fig. 2 Staphylococcus colonization is known to colonize skin, nares and pharynx. The anterior nares however have proven to be the primary reservoir of Staph aureus in humans [3]. Intracellular bacteria located within keratin layer of the nasal epithelium provide a sanctuary for this bacteria by protecting them from host defense mechanisms and antibiotic treatment. Fig. 3, 4, 5. Nasal carriage is a risk factor for staphylococcal infections, with >80% of infecting isolates originating from the nose of the patient. In addition, eradication of nasal carriage often eliminates the organism from other body sites as well.

Conclusions

In this pilot study we found that around 40% of patients were colonized with MSSA and 4% with MRSA. According to a 2002 National Health and Nutrition Examination Survey, MSSA and MRSA colonization prevalence estimates were 32.4% and 0.8% respectively (4). Our study showed similar demographics, but higher prevalence of MRSA, which may be an indication of increasing burden. Although, this study has the limitation of being conducted at a single site and on limited number of cases, it does illustrate the changing trends in the epidemiology of S. aureus colonization. This trend suggests the MRSA burden would steadily increase with time. New strategies are therefore needed to fight the war against this “superbug” to protect our patients. We recommend screening high risk patients undergoing major ENT surgery, particularly sino-nasal procedures.

Bibliography