Journal of Nepal Dental Association (2010), Vol. 11, No. 2, Jul.-Dec., 182-185

Case Note

Acquisition of methicillin – Resistant Staphylococcus aureus in maxillofacial patients

Baliga M[1], Joshi S[2], Poojary D[3]

[1]Professor, [3]Assistant Professor, Department of Oral and Maxillofacial Surgery, Manipal College of Dental Sciences, Mangalore, India, [2]Lecturer, Department of Oral and Maxillofacial Surgery, Kist Medical College, Imadol, Lalitpur, Nepal

Abstract

Methicillin resistant staphylococcus aureus (MRSA) has become an important source of infections during the past 20 years. This pathogen is presently responsible for up to 61% of staphylococcus infections. Although the rate of MRSA infection in maxillofacial surgical patient is not well established; we report four cases of MRSA, hospital acquired who required prolonged hospital stay and had delayed wound healing. The infection was treated with susceptible antibiotics and all four cases recovered well. The oncology patients are definitely at a greater risk. The future control of MRSA in surgical patients should focus on effective prevention of endogenous infection. Also MRSA screening for all patients who are undergoing oncological procedures should be done routinely.

Introduction

Staphylococcus is a common pathogen observed in the head and neck region. It causes skin and soft-tissue infection, pneumonia, osteomyelitis, septic arthritis, bacteremia, and other invasive diseases[1]. Methicillin - resistant staphylococcus aureus (MRSA) infection is of serious concern for surgical patients and is associated with additional morbidity, delayed wound healing, increased duration of stay and mortality[2]. Endemic MRSA cross-infection represents a global problem, although major differences in MRSA control have been achieved with different strategies. MRSA also exerts significant physical and financial pressure on patients and hospitals[3]. Hospital-acquired infection (HAI), also known as nosocomial infection, is defined as an infection for which there is no evidence of its presence or incubation at the time of admission (CDC, 2002); or any infection acquired within 72 hours of admission to hospital (Ward et al, 1997)[4]. MRSA is also termed as 'bug-bear' of surgical practice[5,6]. MRSA infection rates are increasingly used as indicators of quality of care. Surveillance and reporting of MRSA rates in acute care hospitals have been mandated by state legislation in the United States and several European countries[7]. We present four cases who acquired MRSA infection during the course of their hospitalization.

Case report - 1

A 56 year old male patient, a known case of Carcinoma (Ca) of the buccal mucosa previously treated with irradiation (60 cGy) presented with a residual ulceroproliferative lesion in right cheek. CT scan revealed involvement of mandible and level I, level II and level III lymph node involvement. The patient underwent composite resection and supraomohyoid neck dissection (SOHND). The defect was closed with pectoralis major myocutaneous flap. On 8th post operative day serosanguineous discharge was seen from the recipient site (Fig 1) however the patient didn't develop any high grade fever nor other systemic involvement. The discharge sample was sent for bacteriological evaluation which showed presence of methicillin resistant staphylococcus aureus (MRSA) organisms and was susceptible to teicoplanin. The intravenous antibiotic was started immediately followed by daily dressing. The patient recovered well though prolonged hospitalization was required.

Case report - 2

A 60 year old male with controlled hypertension presented with an ulcerated lesion in relation to lower right alveolus premolar molar region. Incisional biopsy was done and a diagnosis of moderately differentiated squamous cell carcinoma with TNM staging of T3 N2a M0 was arrived

Correspondence

Dr. Sandhya Joshi, Lecturer, Department of Oral and Maxillofacial Surgery, Kist Medical College, Imadol, Lalitpur, Nepal.
E-mail: sandhyajo@hotmail. com

at. The patient was subjected to hemimandibulectomy, SOHND and primary closure. On day 7, after removal of all sutures, pus discharged from the submandibular incision site (Fig 2). On bacteriological evaluation of the pus, MRSA was noted. He didn't develop any systemic signs and symptoms. Intravenous antibiotic was started and the patient was discharged on day 21.

Case report 3

A 57 year old male who had undergone right sided hemimandibulectomy for ameloblastoma complained of unaesthetic appearance. He was undertaken for free fibular graft (Fig 3). On day 7, slight gaping in the angle region with pus discharge was noted. MRSA was grown in the culture media when it was sent for evaluation. The patient was treated with intravenous antibiotic and local treatment of the wound with Mupirocin ointment. The patient had extended hospital stay and was subsequently discharged once the wound healed.

Case report 4

A 26 year old male, case of polytrauma (Fig 4) due to road traffic accident with normal GCS had sustained bilateral mandibular fracture (angle and body on left side, parasymphysis on right side), unilateral femur fracture and bilateral radial fracture. He had 3X1 cm laceration over left angle region which was intermittently bleeding profusely. Primary measures to secure hemostasis failed and patient was progressing towards hypovolemic shock. Immediately tracheostomy was carried out and wound exploration was done. The continuing hemorrhage was difficult to manage and therefore emergency external carotid ligation had to be undertaken. After 72 hours patient developed high fever, oliguria and marked leucocytosis. Blood was sent for culture and sensitivity and which revealed presence of MRSA. The intravenous antibiotic meropenem was started immediately followed by continued dressing of the wound. However there was no discharging pus from the wound site. The patient later underwent definitive management for mandibular, radius and femur fracture. The patient had extended hospital stay and recovered well.

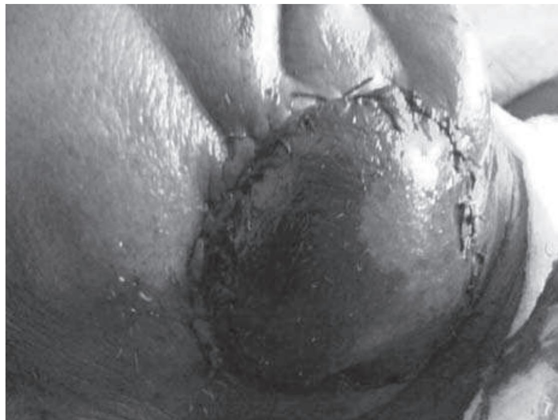

Fig 1: Pectoralis major myocutaneous flap failure

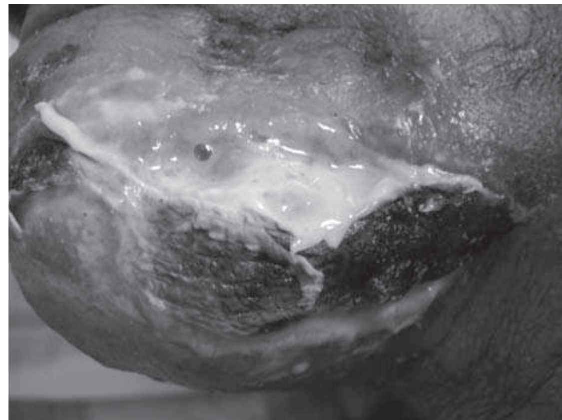

Fig 2: Failure with Primary closure

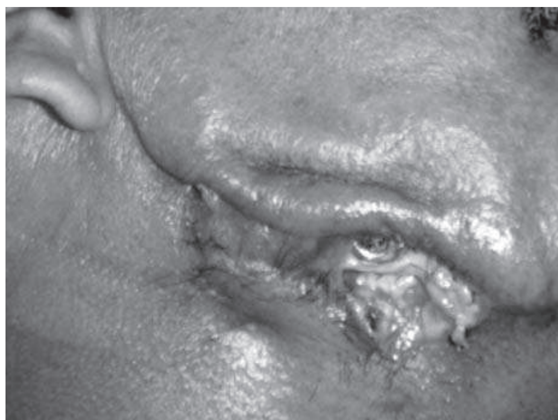

Fig 3: Reconstruction with free fibula graft

Fig 4: Case of Polytrauma

Discussion

In response to increasing rates of MRSA in healthcare settings in many parts of the world, great effort is being put forth to determine effective infection control practices to limit the spread of MRSA and minimize its impact on patient health and hospital budgets. The purpose of this paper was to report the primary site only which may have underestimated the infection rate. None of the cases were screened before hand and screening all the patients is questionable. All the patients had only single episode of MRSA infection. The rate of MRSA was significantly high in oncological group and this is accordance with various other authors who have reported similar findings[2,8]. Various studies have shown reduction in MRSA rate after decolonization with Mupirocin[9]. The antibiotic prophylaxis for first three patients was ciprofloxacin with gentamicin intravenously which was continued till the seventh day. For the fourth case of polytrauma the third generation of cephalosporin was started. The surgical procedures were carried out while observing the general rules of sterility. All wounds were prepared with povidone iodine, chlorhexidine gluconate pre operatively and irrigated with povidone iodine, metronidazole solution before closure. Postoperative wounds were evaluated daily and monitored until the end of the postoperative hospital stay. Wound infection is defined as the presence of purulent drainage from the wound or the presence of an orocutaneous or pharyngocutaneous fistula regardless of origin (including flap failure)[8]. All the samples were collected from the infected wounds and organisms were identified to be methicillin resistant staphylococcus aureus.

A lack of sufficient room or nursing staff capacity to implement patient isolation in single rooms was reported to be commonplace across hospitals in many parts of Europe and, in turn, was associated with higher institutional prevalence of MRSA. However we didn't find increase rate of MRSA despite the fact that hospital lacked facility of side room. All patients were managed with local measures and intravenous antibiotics. No mortality was associated with MRSA infection however longer duration of stay was noted with all the infected patients[10]. An International consensus should be achieved on case definitions, prevalence and incidence indicators and genotyping strategies to support the setting of prevention targets and monitoring progress at local and national levels. In light of increasing incidence of MRSA infections in hospitals and communities, health care workers should practice careful infection control practices and consider the possibility of MRSA infection when symptoms fail to resolve promptly with standard therapies. Further, molecular analyses of the strains to better characterize Hospital acquired MRSA- and Community acquired-MRSA was not possible because of unavailability. The importance of hand hygiene should be reinforced regularly to all health professionals. Hand washing is a simple way of doing more with less. Education is important to make professionals aware of the problem that still persists and regular audits can help make them adhere to the good practices[11].

Conclusion

MRSA is at present the most commonly identified antibiotic-resistant pathogen globally.

Drug resistance in *S. aureus* is of considerable importance in clinical practice. Antimicrobial resistance of *S. aureus* to penicillin, methicillin, or vancomycin is a consequence of antibiotic exposure. Minimizing this pressure is essential to controlling the emergence of resistant strains in the hospital and in the community, regardless of their origins. The risk is significant in case of oncological patients. Therefore the importance of infection control surveillance in MRSA outbreaks is well established, and early detection can arrest such infections.

References

1. Kathleen M. McMullen, David K. Warren, and Keith F. Woeltje. The changing susceptibilities of methicillin-resistant Staphylococcus aureus at a mid western hospital: The emergence of community. Am J Infect Control 2009; 37: 454-7.
2. Rogers SN, Proczek K, Sen RA, Hughes J, Banks P, Lowe D. Which patients are most at risk of methicillin resistant Staphylococcus aureus: a review of admissions to a regional maxillofacial ward between 2001 and 2005. Br J Oral Maxillofac Surg 2008; 46: 439–444.
3. Stephan Harbarth, Didier Pittet. Control of Nosocomial Methicillin-Resistant Staphylococcus aureus: Where Shall We Send Our Hospital Director Next Time. Infect Control Hosp Epidemiol 2003; 24: 314 -316.
4. Shiomori T, Miyamoto H, Udaka T, et al. Clinical features of head and neck cancer patients with methicillin- resistant Staphylococcus aureus. Acta Oto-Laryngologica 2007; 127:180–5.
5. Nicolas Penel, Danie´ le Lefebvre, Charles Fournier, Je`rome Sarini, Ahmed Kara, Jean-Louis Lefebvre. Risk factors for wound infection in head and Neck cancer surgery: a prospective study. Head Neck 2001; 23: 447–455.
6. Guyot A, Layer G. MRSA - 'bug-bear' of a surgical practice: reducing the incidence of MRSA surgical site infections. Ann R Coll Surg Engl 2006; 88: 222–3.
7. Stephen G. Weber, Susan S. Huang, Shannon Oriola, et al. Legislative Mandates for Use of Active Surveillance Cultures to Screen for Methicillin-Resistant Staphylococcus aureus and Vancomycin-Resistant Enterococci: Position Statement From the Joint SHEA and APIC Task Force. Infect Control Hosp Epidemiol 2007; 28:249-260.

8. Johnston P, Norrish A R, Brammar T, Walton N, Hegarty TA, Coleman N P. Reducing methicillin-resistant Staphylococcus aureus (MRSA) patient exposure by infection control measures. Ann R Coll Surg Engl 2005; 87: 123–125.
9. Robicsek A, Beaumont J L, Thomson R B, Govindarajan G, Peterson L R. Topical Therapy for Methicillin-Resistant Staphylococcus aureus Colonization: Impact on Infection Risk. Infect Control Hosp Epidemiol 2009; 30:623-632.
10. Lugg GR, Ahmed HA. Nurses' perceptions of methicillin-resistant Staphylococcus aureus: Impacts on practice. British Journal of Infection Control 2008; 9:8-13.
11. Bhojani S, D'Costa S, Gupta A. Hand hygiene: Simple, inexpensive and an effective tool. British Journal of Infection control 2008; 9:15 -17.