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REVIEW ARTICLE

Current Knowledge about Nosocomial Infections

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ABSTRACT
Nosocomial infection is one of the infections, which arise during hospitalization of patient in hospital. Incidence of nosocomial infection is inevitable in medical centers and one of the foremost healthcare goals in medical center is control of this infection. Catheter and probe etc. should be utilized under certain conditions and at least cases. Many different literatures on the subject matter from different database sources were reviewed and used. With respect to high sensitivity of Intensive Care Unit (ICU), it seems very logical and necessary to observe healthcare point perfectly by personnel and staffs in medical centers in these units, using antimicrobial gels, and utilization from disposable gloves and masks in exposure to patients. Furthermore, dosage of antibiotics should be controlled. At the same time, proper follow-up and on time reporting about nosocomial infection cases and correct diagnosis of types of intervening microorganisms in this process and also follow-up the discharged patients in terms of nosocomial infection may be useful in validation of the recorded cases.
Keywords; *Nosocomial, Infection, Hospital*

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INTRODUCTION

The nosocomial infections are some the major problems in hospital environments and act as the factors for increasing diseases and mortality. The existing resistance against antimicrobial factors in many types of pathogens causes some problems in therapy as well as rising rate of diseases and mortality. This issue is one of the foremost cases we encounter in Intensive Care Unit (ICU) [10]. Wide dosage of immunity system inhibitory drugs and antibiotics has caused the patients to be vulnerable to this type of infections. Alternately, the existing transferable resistance among pathogens versus antibiotics has led to intensification of incidence of nosocomial infections [2]. These infections are treated with difficulty and sometimes they may lead to death of the patients and they are assumed as ever-increasing risks [3]. With respect to resistance of most of microbial vectors, treatment of nosocomial infections is very difficult and due to long period of hospitalization of patients, therapy is very expensive with high cost [3, 4]. At the same time, through spending lower costs and with respect to healthcare in hospital and microbiological diagnosis, most of nosocomial infections may be controlled and it can be prevented from their incidence [5]. The rate of prevalence of this type of infections is related to hospital status, type of therapy ward, and the patient [3, 6, 7, 2]. Publishing the results came from studies and investigations in medical and scientific journals and periodicals and preparation of training bulletins may enhance the awareness level in the related officials about this type of infections and this may be assumed as a basic step toward treatment and control of the infection [8].

FREQUENCY OF INFECTIONS AND RISK FACTORS

Due to change in cellular and humoral immunity, physiological changes (reduced cough reflex), blood stream disorders, and postponement in cure of old people, their injury and wound is susceptible to this type of infection [9]. The maximum frequency has belonged to the nosocomial infection relating to ICU among various hospital wards according to the previous conducted researches [3, 4, 10, 11, 12].

Pneumonia is the second frequent nosocomial infection after urinary infection that is led to mortality [19]. Age, gender, job, race, hospitalization background, immunologic status, and diseases with background are some of the effective factors. Incidence of nosocomial pneumonia depends on several factors. But its rate is reported 5-10 cases per one thousand hospitalized patients [13, 14].

TYPES OF INFECTIONS

Also in the conducted studies in the world, the nosocomial infections have been widely isolated from types of wounds [2, 3, 5, 8]. The staphylococci are proposed in pneumonia of nosocomial infections including vectors of Aerius, Negative coagulase, *Staphylococcus epidermidis*, enterococcus faecium, pseudomonas aeruginosa, and acetinobacter [17]. *Staphylococcus Aerius* is a part of body's natural flora (hand- nasal ducts) and unfortunately about 90% of the isolated staphylococcus varieties from nosocomial infections are penicillin- resistant (15). *Pseudomonas aeruginosa* and acetinobacter are the prevailing cases of nosocomial infections, especially in ICU. Several bacteria possess potential for survival in hospital environment and they enjoy highly genetic variation (16). The pseudomonas aeruginosa is a gram- negative organism that is prevalent in nosocomial infections including large- scale burnings, surgical wounds, patient with cancer, and immunity system deficiency disorder. Similarly, the specific resistance of this bacterium to several antibiotics has doubled its importance regarding the given infections. For example, this organism has been also isolated from the bottles containing antiseptic solutions in hospitals [18].

POLICY OF PROPHYLAXIS

The medical equipment and hospital instruments used in the hospitals may play major role in transference of infectious factors to the patients and creating nosocomial infections [19]. Washing hands may be assumed as the paramount, simplest, and economic prophylactic technique against spreading infection in ICU but several reasons including lack of appropriate place for sanitary services, unsuitable quality of detergent liquid in WC, inadequate information, working high traffic, lack of scientific knowledge, reduced motive and tendency of personnel, fatigue etc caused this method to become inefficient in some cases. It is recommended the constant training and focus, preparation of facilities like sanitary services and suitable cleansing liquid for WC, simply washing hands with water and soap, the paper towels with high quality, and addressing the personnel's tendency and request [20]. Planning and determination of policy regarding disinfection and sterilization of equipment and instruments in this hospital ward are deemed as the essential measures which should be taken to control nosocomial infection in ICU since there is possibility for transference of infection to the patients following to contamination in the given instruments all the time. The disinfection level also differs proportional to application of instruments. The recommendations for control of nosocomial infections comprise of activation of nosocomial infection control committees, establishment of nosocomial infection control system, training of personnel and particularly the nurses, control of infection, emphasis on washing the hands, appropriate isolation of patients, evaluation of epidemic cases and execution of the needed interventions, observance of disinfection and sterilization points and principles, sanitary disposal of wastes, protection from personnel and their immunization and restriction of dosage of antibiotics with large spectrum. It is noteworthy that despite of employing all of measures, the nosocomial infections can be prevented only in one- third of cases. Three major places for incidence of nosocomial infections are as follows: urinary system (31%), respiratory system (24%), and blood stream (16%), and also skin and other organs. The prevalent diagnoses for infection in the aforesaid points include pneumonia, urinary system infection, and septicaemia. Pneumonia is the most epidemic nosocomial infections in ICU and generally it has been reported as the second frequent type of nosocomial infection. Tracheal osteo-intubation is the most epidemic risk for spreading nosocomial pneumonia. The urinary system infection is reported as the second prevalent infection in ICU. Placement of probe (catheterization) along with formation of microbial biofilm including staphylococcus bacterium and Candida fungus as well as placement of catheter in urinary system devote about 80% of causes of infections. The long- term placement of catheter in urinary duct is assumed as the greatest risk factor for creation of this infection. Likewise, whereas the phenomenon of biofilm formation is considered as an important factor in drug resistance and reduced drug sensitivity thus this point is important and the existing compounds in the used catheters for hospitalized patients and or in users of urinary catheters in hospital should be taken into consideration for which this may lead to various type of fungal diseases and candidiasis (yeast infections) including candidemia and urinary candidiasis [21, 22, 23]. The infections in blood stream (sepsis) are assumed as the third frequent nosocomial infection in ICU that about 2% to 7% or more of internist and surgical wards suffer from them. The rate of blood stream infections are followed by using catheters in central vena further than peripheral catheters. Properties of skin (humidity and heat) in

place of catheterization may be effective in different rates of infections [22, 24]. Several factors may increase the exposure to infection and transference of pathogens including age in old people and new-borns, surgery, immunity system deficiency, chronic diseases like diabetes, cirrhosis, renal failure, cancer disease, rising intensity of trauma in ICU patients, frequent use of instruments and invasive techniques, and frequency of contact to therapeutic members [22, 23].

CONCLUSION

At present, the perfect deletion of these infections is not possible in any point of the world but the successful prophylaxis requires paying attention to infection creating sources and taking infection control methods properly, comprehensively, and permanently and by taking suitable measures one could reduce the rate of these infections including washing the hands by personnel of hospital, observance of personal healthcare by patients, and control the healthcare in hospital environment, and prevention from inappropriate dosage of antibiotics. Acquiring information from the situations which improve infection control and prevent from contamination is assumed as a basic step [25, 26, 27].

REFERENCES

1. Arvanitidou M., Katikaridou E, Douboyes J, Tsakris A (2006) .Prognostic factors for nosocomial bacteraemia outcome. J Hosp Infect, 61: 219-224.
2. Eriksen HM, Iversen BG, Aavitsland P. (2005) Prevalence of nosocomial in fections in hospital in Norway, 2002and 2003. J Hosp infec, 60: 40-45.
3. Zolldann D, Haefner H, Poetter C, Buzello S (2003). Assessment of a selective surveillance method for detecting nosocomial infections in patients in the intensive care department. AJIC Major Article, 3: 261-265.
4. Unal S, Rodriguez JAG (2005). Activity of meropeneme and comparators against pseudomonas aeruginosa and Acinetobacter spp isolated in the MYSTIC program, 2002-2004. Diagnostic Microbiology and Infectious Diseases,; 53: 265-271.
5. Georgia A (2004), National Nosocomial Infectious Surveillance (NNIS) System Reports data summary from January 1992 through June 2004. Am J Infect Control, 32: 470- 85
6. Askarian M, Rostami N (2003). National nosocomial infection surveillance system –based study in Iran; Additional hospital stay attributable to nosocomial infections. AJIC Special Article, 31: 465-468.
7. Gastmeier p, Geffers C, Schwab F, Fitzner J, Obladen M.(2004) Development of surveillance system for nosocomial infections, the componentfor neonatal intensive care units in germany. J Hosp Infect,; 57: 126-131.
8. Askarian M, Hosseini R, Kheirandish P.(2004) Incidence and outcome of nosocomial infections in female burn patients in shiraz, Iran. AJIC,; 32: 23-6.
9. Kaoutar B,Joly C,Heriteau FL, Barbut F. (2004) Nosocomial infections and hospital mortality; a multicenter epidemiological study. J Hosp Infec, 58: 268-275.
10. Jeong SH, Bae IK, Kwon SB. (2005) Investigation of a nosocomial outbreak of Acinetobacter baumanii producing PER-1 extended – spectrum B-lactamase in an ICU. J Hosp Infect; 59: 242-248.
11. Befez C, Fabbro P, Bouziges.(2004) Risk factors for multidrug resistant pseudomonas aeruginosa nosocomial infection: J HOSP Infect,; 57: 209-216.
12. Flanders SA, Collard HR, Saint S (2006). Nosocomial pneumonia; state of the science. Am J Infect control,; 34: 84 - 93.
13. Mandell GL, Bennett GE, Mandell, Douglas & Bennetts. (2004)Principles and practice of infectious disease. New York. Churchill livingstone, 2565-72.
14. Susan S Hung, Richard Platt. (2003)Risk of Methicillin – resistant Staphylococcus Aureus after previous infection or colonization. Clin infect Dis, 36:281-85.
15. Gastmeier p, Schwab F, Barwolff S, Ruden H, Grundmann H. (2006) Correlation between the genetic diversity of nosocomial pathogens and their survival time in intensive care unit. J Hosp Infec,; 62: 181-6.
16. Nitton A, Rezonde MD, et al. (2003) Risk factors for methicillin – resistance emong patients with Stapylococcus aureus bacteremia ot the time of hospital admission. Amj Med Sic, 323(3):117-123.
17. Giamarellou H(2002). Nosocomial Cardiac infections. Journal of Hospital infection,; 50: 91-105.
18. Behnam Zamanzad: (1996); The model of sensitivity of isolated bacteria from instruments and equipments at various units of Shahr-E-Kurd Kashani Hospital Journal of Shahr-E-Kurd University of Medical Sciences, 3rd series, vol. 4, pp 25-30.
19. Mehdi Hosseini:(2002), Incidence of nosocomial septic infection and some of its risk factors at ICU for newborns in Razi Hospital of Kermanshah City Scientific- Research Quarterly of Kermanshah University of Medical Sciences, 7th year, vol. 3, pp 52-57
20. Mehdi Zobeiri:(2001), Analysis on rate of microbial contamination in ICU practitioners and its relevant factors in Kermanshah University of Medical Sciences Scientific- Research Quarterly of Kermanshah University of Medical Sciences, 9th year, vol. 2, summer pp 52-57.
21. Berenholtz S.M, Pronovost P.J, Lipsett P.A(2004) Eliminating catheter-related bloodstream infections in the intensive care unit. Crit Care Med; 32(10):2014– 2020.
22. Emilia Ma, Baleva A,Adrian C. Pena, (1990) Catheter-Related Intravascular Infections in Critical Care Units. Infect Diseases & Tropical Med; 26(2): 251-54.

23. Challacombe S. J, (2001) Immunologic aspects of oral candidiasis. Oral Surg Oral Med Oral Pathol; 78:202-210.
24. Jafarzadeh A, Hassanshahi GH,(2009).Serum levels of High-sensitivity CReactive protein(hs-crp) in Helicobacter pylori-infected peptic Ulcer patients and Association with bacterial CagA virulence factor.Dig Dis Sci;54(12) :2612-1616.
25. Katz J.D. et al. (2004), Hand washing and hand disinfection: more than your mother taught you, Anesthesiol. Clin North America; 22 (3): 457-471.
26. Costantini1 M, Donisi1 P M, Turrin M G, Diana1 L (2004). Hospital acquired infections surveillance and control in intensive care services, Results of an incidence study; 3(4):347-355.
27. Shahsavari S ,Beigi Marvast P,Behinaaine n,Ayatollahi A,(2004)Teaching Nursing students about the Basic principles of Infection Control: Programmed Instruction or Lecture Method.Iranian J med Educat;4(1):22-27.

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