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Popular Article

Hospital acquired infections from veterinary hospitals: A review

Vijay Bhaskar Gajula, Vijaya Kumar A, Kumar E and N Krishnaiah

Department of Veterinary Public Health & Epidemiology,

College of Veterinary Science, Rajendranagar.

P V Narsimha Rao Telangana Veterinary University, Hyderabad.

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Abstract

The present manuscript describes about the hospital acquired infections, causative organisms, the factors effecting the occurrence of infections, development of drug resistance by infectious agents, spread of infections to other inpatients, owners of pets, staff, economic losses due to nosocomial infections and incidence of morbidity and mortality of animals. These infections may spread easily because of unsanitary, irregular hygienic practices and prove fatal too if overlooked. Regular practice of general infection prevention measures like personal hygiene and environmental hygiene in veterinary hospitals may help in reduction of morbidity, mortality of animals and economic loss to pet owners.

Introduction

Nosocomial infections are also known as Hospital acquired infections are infections acquired during the process of hospitalization are inherent risks in fields of human and veterinary practice (Stull *et al.*, 2015). Causative organisms of nosocomial infections include bacteria, viruses, fungi. Among all, bacteria are common pathogens followed by fungi and viruses (Anna Sikora *et al.*, 2022). Parasites also play significant role in nosocomial infection which are acquired via blood transfusion or organ transplantation (Fürnkranz and Walochnik, 2021). because of these infections animal



increases its hospitalization which creates economic loss to animal owner, some of these infections may spread to other animals which are in hospital and animal attendants, health care workers.

Due to the strong bond between humans and animals, pets also gain from cutting-edge hospital treatment in the event of sickness or accident. As high concentration of susceptible patients and the selective pressure imposed using wide acting antimicrobials and veterinary hospital environments favours the selection and transmission of MDROs. Small animal patients may therefore develop MDROs while they are in the hospital. When addressing the One Health aspects of AMR, it is crucial to comprehend the possibility of cross-species transfer of MDROs or pertinent resistance genes between MDRO-carrying pets and their owners.

In India, till date no data is available pertaining to the nosocomial infections from the veterinary hospitals. However, numerous documented nosocomial outbreaks of different etiologies in both large and small animal veterinary hospitals have led us to believe that nosocomial infections are serious problems in veterinary medicine (Dallap Schaer *et al.*, 2010).

Types of hospital acquired infections:

Frequent types of HAI's include surgical site infections, urinary tract infections which are associated with catheters, ventilator associated pneumonia and central line associated blood stream infections. Central line associated blood stream infections may be fatal too, having incidence rate of 12%–25% of deaths. Catheters are placed in Central line of animal to provide fluids and drugs, prolonged usage of catheters can lead severe blood stream infections which resulting in decrease in immunity levels of animal and increases the cost of hospital care. Surgical site infections are nosocomial infections be fall in 2%–5% of patients subjected to surgery. 86% of nosocomial pneumonia is associated with ventilation. (Ahmed Khan *et al.*, 2017).



Major Causative organisms of hospital acquired infections:

Type of causative agents	Major Causative organisms	Reference
Bacteria	Methicillin-resistant staphylococcus aureus, <i>Clostridium difficile</i> , Multi drug resistant <i>Escherichia coli</i> , Salmonella spp. Etc.,	Prince milton et al., 2015
Viruses	Hepatitis B, C. influenza, and rotavirus,	Ahmed Khan et al., 2017
Fungi	Candida spp., Aspergillus spp., Mucorales, Fusarium spp etc.,	Perlroth et al., 2007
Parasites	Toxoplasma gondii, plasmodium spp., Babesia spp, Demodex folliculorum/Demodex brevis, Giardia spp, Cryptosporidium spp., etc	Fürnkranz and Walochnik, 2021)

Transmission of nosocomial infections:

Source of nosocomial infections includes exogenous and endogenous sources, Endogenous source of infection is patient's own flora by auto infection and exogenous source of infections includes infection from infected animal, blood products, rats/mosquito bites, through environment (air/droplet), Food and water in hospitals, movement of health professionals and contaminated medical devices, surgical instruments like catheters, nasogastric intubation tubes.

Transmission by most commonly through contact -Direct (by physical contact), Indirect via contaminated objects from hospitals, Airborne infections by droplet or inhalation. food borne and blood borne transmissions are rare (Prince milton et al., 2015).



Effects on animal health and its prevention:

Nosocomial infections may aggravate already underlined disease conditions. some of the organisms develops resistance to multiple drugs, these multidrug resistance organisms (MDRO's) are often involved in hospital acquired infections, complicating the treatment which results in poor prognosis of the patient. additionally due to extensive advancements in veterinary medicine there may be simultaneous increase in risk of HAI's through the use of more invasive techniques and devices such as urinary catheters, intravenous catheters etc., Catheter associated UTIs (urinary tract infections) are one of the common HAI's in small animal veterinary medicine although data regarding veterinary medicine data often limited by the failure to differentiate bacteriuria from UTI. Some HAI's are highly contagious, often brought in by infected dogs and appear as epidemics such as canine parvo virus and kennel cough (<https://www.vetlexicon.com/treat/canis/freeform/hospital-associated-infections>).

To prevent the spread of multidrug resistance organisms to other patients, the veterinarians should take all precautionary measures while treating. Most effective method to limit the spread of these infections is hand washing with soap for a period of at least 1 minute if the hands are visibly dirty, if hands appear clean hand rubbing with a 70% alcohol or foam for 20-30 seconds, before and after treating of each patient (Gaschen *et al.*, 2008).

Impact of nosocomial infections on human beings:

Different studies showed that even people who are closely associated with animal patients (hospital staff, animal attendants) are not an exclusion for nosocomial infections. As the veterinary hospital environment is a human animal interface, it remains potential source of zoonotic pathogens, their veterinary health care workers and animal owners are at an increased risk of contracting various zoonotic infections. which is likely to put financial stress regarding human health system (Sebola *et al.*, 2023).

Some veterinary hospital associated pathogens (MRSA, Salmonella) can be transmitted to hospital staff or pet owners which results in human illness. It is important to note that having



abnormally high proportion of veterinarians are colonized with MRSA as compared with normal public.

Veterinarians who treat animals that suddenly become ill with confirmed infections should assess the risk for zoonotic potential and inform the animal owners accordingly (Kahn, 2006)

Conclusion

The main challenges must face by veterinarians at this time are nosocomial infections and multidrug resistance bacteria. Regular microbiological surveillance of veterinary hospitals is required to detect and control of infectious agents, educating health care workers, animal attendants on best hygienic practices could help in reducing nosocomial infections.

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