Audit of dog bite among children at a tertiary care hospital

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Abstract

Background: Animal injuries are common throughout the world. Dog bite injuries stand at the top. Children are the most common victims of dog bites due to limited self protection and more outdoor activities and mischievous behavior.

Objective: To determine the outcome of dog bite in children.

Methodology: This was a cross sectional study that was performed on patients referred or brought to our department directly with serious dog bite injuries. Overall, 26 patients were enrolled during the period of September 2016 to October 2018, admitted in the department of paediatric surgery. Wound management including irrigation, and debridement were done. Antibiotics were given and anti rabies vaccination was carried out. Skin grafting was done in 4 patients who got full thickness skin loss from scalp due to degloving injury. The outcome was noted

Results: Results were compiled on 26 patients. Most of the patients were males (69.2%), and 5-10 years was the commonest age group, and 46.5% of the patients were having 3-5 wounds and head and neck was the most common area injured, 14 (53.84%) patients presented with punctured and lacerated wounds. Management varied case to case. One patient died due to septicemia.

Conclusion: Most of the children with dog bite have age less than 10 years and few results in complications as well. Children should be educated about dog behavior. There should be strict legislation about dog keeping and management including antirabies vaccination. More and more dog centres should be established and stray dogs wiped out.

Keywords: Dog bite, Rabies, Children, Vaccine, Animal, Outcome.

Introduction

Dog bite injury is a serious public health problem throughout the world, especially for children.[1] It is responsible for a number of infectious diseases, such as rabies.[2] Children are less defensive and they are more involved in outdoor activities that is why at higher risk of being bitten by a dog than any other age group.[1] According to data presented by World Health Organization (WHO) in 2013, animal injury has become a major cause of morbidity and mortality for children throughout the world and two-thirds of injuries by animals are caused by dogs.[2] Children have short stature, do not have a good awareness of danger, and are curious to explore the unknown.[3,4] However, children do not have the relevant knowledge and information required to manage their injuries in a proper way and timely fashion. So, it may result into serious morbidity and mortality. Furthermore, children are more prone to psychological trauma. According to a study there is high incidence of PTSD (post-traumatic stress disorder) in children injured by pets.[5] There are a number of complications due to dog bite injuries i.e., wound infection, septicemia cosmetic defects, loss of function, loss of limb, and death due to septicemia or rabies. Dog bite is grave but preventable problem in children and children can learn to reduce their chances of being bitten. Dog bites can be reduced with active and constant efforts laid by the community.[6] It is important to formulate definitive preventive measures, to understand the circumstances and characteristics of dog bites. In this study we tried to assess the outcome of dog bite injuries and their management in children.

Methodology

This was a cross sectional study, carried out from July 2016 to September 2018 in DHQ Teaching Hospital, Sahiwal, and 26 patients were included in total. All patients were received either through ER, or directly admitted in department of paediatric surgery, were included in this study. Patients who were not admitted due to minor injuries or parents unwillingness for admission were excluded. All patients got generous irrigation of bite wounds with normal saline and early debridement in selective cases if indicated. After thorough cleaning and debridement, the lacerations was left open except facial which were repaired. Drainage was carried out depending on the actual condition of laceration. Drain was placed inner most of the wound and

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replaced or pulled out according to the drainage quantity, usually 24-48 hrs after operation. All the wounds were covered with sterilized dressing and changed dressings 24-48 hrs after operation. The stitches for facial wounds were removed 5-7 days after operation according to the wound healing condition. Anti- rabies vaccination was started on day 1 and five doses were advised to all patients, tetanus toxoid was given if there was no sure of complete tetanus vaccination or it was given 5 years back. Anti- rabies immunoglobulins were given in case of suspected rabid dog. Intravenous antibiotics cover was given to all admitted patients. In routine, amoxicillin and clavulanic acid combination with metronidazole were given but meropenem was added for cases who landed late with infection and septicemia.

All the data was analyzed statistically using SPSS software 20 and Student's t–test to determine any statistical significance. p-valve<0.05 was taken statistically significant.

Results

In this study,18 (69.23%) of our patients were males and the commonest age group was 5-10 years (61.53%), (table1). No. of wounds was variable. Only 6 (23.07%) of 18 patients presented with 1-2 wounds while 12 (46.15%) presented with 3-5 wounds. Head and neck was the commonest area involved (Table I).

Table I: Demographic variables

Age	No. of patients	Percentage	Sex	No. of patients	Percentage
< 5 years	4	15.38	Male	18	69.23
5-10 years	16	61.53	Female	8	30.76
>10 years	6	23.07			
No. of wounds	**No. of patients**	**Percentage**	**Distribution (Area involved)**	**No. of patients**	**Percentage**
1-2	5	19.23	Head and Neck	8	30.76
3-5	12	46.15	Upper Limbs	4	15.38
6-10	7	26.92	Lower Limbs	6	23.06
>10	2	7.69	Trunk	3	11.53
			Multiple Areas	5	19.23

Patients were having different types of wounds, i.e. punctured, lacerated, degloving injuries. Punctured and lacerated wounds were at the top (53.84%), while only 2 (7.69%) presented with compound fractures. All patients underwent wound irrigation, I.V antibiotics and anti-rabies vaccination. Tetanus prophylaxis was given in 19 patients, and 4 of 26 patients received anti-rabies immunoglobulins, 14 debridement, 6 primary suturing and 4 skin grafting. Details are given in table II. Wound infection in our series remained 26.92% while 1 (26) died due to septicemia. (Table II)

Table II: Management of outcome of dog bite children

Type of wound	No. of patients	Percentages
Punctured	6	23.06
Punctured and lacerated	14	53.84
Degloving injuries	4	15.38
Wounds with fractures	2	7.69
Management	**No. of patients**	**Percentages**
Wound irrigation and dressing	26	100
IV Antibiotics	26	100
Tetanus toxoid	20	76.92
Antirabies vaccination	26	100
Immunoglobulins	4	15.38
Debridement	14	53.84
Skin grafting	4	15.38
Debridement and suturing	8	30.76
Complications	**No. of patients**	**Percentages**
Wound infection	7	26.92
Septicemia	1	3.84
Death	1	3.84

Discussion

Domestic animals have long association with man, and dog is one of the favourites. Management of dogs is one of the neglected issues in Pakistan, which took many human lives due to disease and injuries caused by dogs. Although dogs have important and vital roles in human life. They are being used for security purposes worldwide. Generally, dog population is going up with rising human population. In this regard, a lot of stray, diseased and unvaccinated dogs are found in many countries worldwide.[6] It is estimated that incidence of human dog bite injury is more in rural than urban areas in Asia.[7] In our study, we received 24 (26) cases of dog bite from rural while only 2 (26) from urban areas. Throughout many developing countries, a large number of dogs move freely in human community and breed in an uncontrolled manner. This is especially the case in developing countries like Bangladesh and Pakistan.[8,9] In this study, 16 (26) of our patients were under 10 years. Dog bites occur more frequently in young children,[10,11] as the children cannot tolerate severe injuries they have high mortality.[12] In Canada,

between 1990 and 2007, 24 of 28 fatal dog bites occurred in children younger than 12 years of age.[13] Most of our patients were bitten at 3-5 different sites and head and neck was the commonest area involved, 8 (26%). C. O'Brien et al, found 101 (334) injuries involving head and neck nearly the same as we found.[14]

After primary survey wherever indicated we followed the guidelines given in literature for local management of the wounds. As advised by Centers for Disease Control and Prevention, the affected area should be properly cleansed, and irrigated with the help of normal saline and diluted pyodine solution especially if rabid dog bite is suspected.[15] To irrigate the wound, we used 20-mL or larger syringe to create high pressure required for adequate cleaning. We also did cautious debridement of necrotic and devitalized tissue to reduce the chances of infection. Many authors were doing the same for local wound management.[16,17,18] In 8 (26) of head and neck wounds, we did primary closure after debridement, all others were left open. Only one of our patients with primary wound closure got wound infection. Ruifeng et al mentioned that immediate primary closure does not result into high incidence of wound infection in facial wounds.[19] Wounds due to dog bite injuries are special wounds. High infection rate (18 - 25%), serious complications, and almost 100% mortality of rabies was mentioned in literature.[20] In this study, 7 (26.92%) of our patients got wound infection, 1 out of 26 has septicemia and the same patient died due to septicemia. All of our 26 patients admitted got intravenous antibiotics cover due to low immunity and poor nutrition although prophylactic antibiotic in initially uninfected wounds is a matter of controvery.[21] They found only one small trial involving 172 dog bite patients who used co-amoxiclav.[22] In that study, co-amoxiclav was given to 84 patients, with 88 given placebo. Infection rate decreased significantly in antibiotic group (33% of those receiving co-amoxiclav developed infection, as compared to placebo, 60% got infected).[22]

All of our patients were vaccinated against rabies and 4 out of 26, got immunoglobulins. As mentioned by Rui-feng CHEN et al, proper wounds debridement and cleaning, normal passive and active immunity are the most reliable tools to prevent rabies.[23,25] Therefore, we believe that meticulous debridement without delay was a key point not only preventing rabies but also in minimising wound infection rate. Most of the studies conducted worldwide show that most of the biting dogs were either pet and known to the victims or their relatives and closely observed during the post bite period[26,27] but in Pakistan, there have no established guidelines regarding dog management, that is why prevalence is very high and further no guidelines have been yet established to observe or isolate those dogs that bite. This is also important with regards to vaccination, for the fact that patients who continue to receive rabies vaccination in the post bite period have to discontinue vaccination after administration of the third dose only, if the dog does not show any features of rabies after 10 days of observation.[28]

Conclusion

This study showed that most of the children of dog bite have age less than 10 years of age, and had punctured wound and some of the patients have wound infection. Dog bite is a common health hazard in paediatric age group in Pakistan. This is due to poor dog management and lack of children awareness about dog behavior. There is no legislation about dog keeping and anti- rabies vaccination. Dog centres are lacking. So, higher authorities should take an action against stray dogs, legislation should be done and families must be counseled about dog behavior. Children bitten by stray dogs should be immediately managed.

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