



THE STUDY OF NECROTISING FASCIITIS DUE TO BITE OF INDIAN RUSSELL VIPER

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Abstract: Necrotizing fasciitis is an infection of deeper layers of skin and subcutaneous tissues confined up to facial planes. Here we are presenting the series of cases of Necrotizing fasciitis caused by the bite of Indian Russell viper [Daboia russeli], a snake found in Asian region. This is a study of patients coming to R. D. Gardi medical college, Ujjain, with Necrotizing fasciitis in the period between 1st of January 2010 to 15th of March 2014. The study was in terms of etiology, age and sex of the patients, parts of body involved, region from which the patients came, seasonal distribution and hospital stay. The cases of Necrotizing fasciitis coming to the hospital, caused due to snake bite were 25.49% of all the cases and mostly the patients were males belonging to rural population. Pus culture showed similar type of bacteria's as in other cases. Hospital stay was more in these patients. Even the graft rejection was more. The Necrotizing fasciitis caused by the bite of Indian Russell Viper is more severe and requires aggressive management to limit its spread and minimize its complications.

Key Words: Necrotizing fasciitis, Daboia russeli, Snake bite.

INTRODUCTION

Necrotizing fasciitis is an infection of deeper layers of skin and subcutaneous tissues easily spreading across the facial planes with in subcutaneous tissues (1,2). It can be divided into two types; Type 1 is polymicrobial infection with aerobic & anaerobic organisms like clostridium & bacteroid species. Type 2 is caused by Group A streptococcus (streptococcus pyogenes species). Commonly it starts as an infection as a response to minor trauma with predisposing factors like diabetes and malnutrition.

In our region of Ujjain district in Madhya Pradesh in India, the bite of Indian Russell viper is one of the common causes of the patients coming with necrotizing fasciitis. Here we are presenting our study of frequency, symptoms and signs of Necrotizing fasciitis caused by the bite of Indian Russell Viper. Indian Russell viper also known as Daboia russeli is commonly found snake in Asian region. Daboia is a monotypic genus of old venomous viper. The species is named in honor of Patrick Russell [1726-1805], a Scottish herpetologist who described many Indian snakes. Apart from being member of big four snakes in India it is responsible for causing most bite incidence and deaths. It is mainly found in crop fields and also in the crevices in the walls of houses. The species found in Indian region are haematotoxic (3), bite of which results into severe coagulopathic effects resulting into disseminated intravascular coagulation and thrombocytopenia which causes multi organ failure and death ranging from 1 to 14 days of bite. Some of the patients which survived suffer from necrotizing fasciitis involving mainly lower and upper limbs. Rarely

the trunk is involved. The bite to the limb causes edema and extravasation of blood locally and starts infection by bacterias followed by the involvement of skin, superficial fascia and subcutaneous tissues.

MATERIALS AND METHODS

The present series is a prospective study of the patients coming to R. D. Gardi medical college hospital during the period in between 1st January 2010 to 15th March 2014 under the diagnosis of Necrotizing fasciitis. We studied about 51 patients of Necrotizing fasciitis. Brief history was taken and clinical examination was done. Hematological investigations were made for total and differential W.B.C. counts and coagulation studies. After the debridement, the pus and other material sent for culture. Then after the development of red healthy granulation tissue, the skin grafting was done and graft intake or rejection and post-operative stay were noted. With full database available, the frequency of the patients with each cause was noted. Seasonal variations were recorded. Then comparisons were made between the different causes and cases of viper bites in terms of involvement of body parts, severity, graft intake or rejections and hospital stay.

RESULTS

Out of 51 patients 13 patients had given the history of bite, other important causes were minor trauma, boils, unknown etiology (Table 1).

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Table 1: Causes of Necrotising Fasciitis (Total number of patients 51)

| | Causes | No. of patients | % |
|---|------------------------------|-----------------|-------|
| 1 | Bite of Indian Russell Viper | 13 | 25.49 |
| 2 | Minor trauma | 18 | 35.29 |
| 3 | Boil (furuncle) | 9 | 17.64 |
| 4 | Unknown | 11 | 21.56 |

Incidence of the cases was high during the months from September to November. Most of the patients in Russell Viper bite group were males (Table 2).

Table 2: Sex distribution (Total number of patients – 13)

| | Sex | Number of patients | % |
|---|--------|--------------------|-------|
| 1 | Male | 11 | 84.61 |
| 2 | Female | 2 | 15.38 |

In most patients the lower limbs were involved. (Table 3). The graft intake was poor and rejection was more in the cases of snake bites. Hospital stay was more in snake bite cases (28-32 days) (Table-4). Bacteria found in pus culture were same for all the cases.

Table 3: Limb distribution (Total number of patients – 13)

| | Limb | Number of patients | % |
|---|-------|--------------------|-------|
| 1 | Upper | 4 | 30.76 |
| 2 | Lower | 9 | 69.23 |

Table 4: Average hospital stay (Days)

| | Cases | Hospital stay (Days) |
|---|--|----------------------|
| 1 | Bite of Indian Russell Viper | 28-32 |
| 2 | Other (Minor trauma, boil, unknown causes) | 20-24 |

DISCUSSION

Necrotizing Fasciitis was first described in specific body region by Fournier in 1883 and as a more generalised condition by Meleney in 1924. The use of term 'Necrotising fasciitis' can be attributed to Wilson in 1952 (4). It is mainly caused by bacteria like group A streptococcus, staphylococcus aureus, vibrio vulnificus, clostridium perfringens, bacterium fragilis (1). Commonly it starts as an infection in response to minor trauma or, as boils. It is associated with diabetes (2) and malnutrition, other cause which is important one

in the Ujjain district of Madhya Pradesh, India is by the bite of Indian Russell viper also known as *Daboia russeli* (5). It is one of the common snakes found in south Asian region, mainly found in crop fields and also in rural and some of the old urban houses. The snake is responsible for most of the deaths due to snake bites in India; Survivors sometimes may suffer from necrotizing fasciitis of the limb involved in bite as a local manifestation. After the observation of long years, we started our study in the affected cases since 2010. Our aim was to study the frequency of the cases, severity of the process, seasonal variation, and type of bacteria's involved and graft acceptance with length of post-operative stay of the patients.

In this study we found that in the cases snake bites, commonly rural population of Ujjain district of Madhya Pradesh was affected. It was found that the necrotizing fasciitis caused by the bites were more extensive involving the affected area like lower and upper limbs. The lower limbs were involved in maximum number of cases as majority of bite incidences occurs in crop fields. Bite incidences were more during September to November, the months of crop development in India. Development of healthy granulation tissue in the affected areas after debridement took longer time. The incidence of graft rejections were more in these case. The hospital stay was long in these patients.

REFERENCES

1. Kotrappa KS, RS Bansal, NM Amin [1996-04] 'Necrotizing fasciitis' American Family physician 53 1691-1697.
2. Elliot DC, Kufera JA, Myers RAM, Necrotizing soft tissue infections, Risk factors for mortality and strategies for management. Ann surg.1996, 224; 672-83.
3. Brown JH, Toxicology and pharmacology of venoms from poisonous snakes. Springfield illinois, Charles C Thomas. 184 PP -02808-7.
4. Wilson B, Necrotizing fasciitis, Am. surgery 1952; 18; 416-31.
5. Murthy TSN 1990 illustrated guide to the snakes of western ghat. India zoological survey of India. culcutta 76 PP, ASIN B0006F2P5C.

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