



## STUDY OF SNAKE BITE INDUCED COAGULOPATHY AMONG HOSPITALIZED PATIENTS IN RELATION TO ACTIVATED PARTIAL THROMBOPLASTIN TIME AND PROTHROMBIN TIME

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### Abstract

Snakes are distributed throughout most of the earth's surface with some exceptions such as the Arctic, Antarctic, and many in small islands. Indian states with high incidence of snakebites cases are Tamil Nadu, West Bengal, Maharashtra, Uttar Pradesh, and Kerala. The main

**Aim:** of this study is to analyse outcome of patients with alleged history of snake bite with respect to coagulation parameters activated partial thromboplastin time and prothrombin Time.

**Material and methods:** Present study was a single center hospital based prospective, observational descriptive study. Conducted in patients admitted to Medical Intensive Care Unit of Krishna Institute Medical Sciences, Karad, over a period of 18 months from November 2020 to April 2022. Total 100 cases were studied. Data analysis: The collected data was compiled in Microsoft Excel 2010. Data describing quantitative measures was expressed as mean, median, mean + SD, standard deviation.

**Results:** The mean age of study population was  $32.2 \pm 11.6$  years, ranging from 17 to 64 years. A majority of patients belonged to age group of 21-40 years (59%). A total of 24% were in age group more than 40 years age, while 17% were in age group 15-20 years. A total of 48 patients had reached the hospital within 30 to 60 minutes (48%). There were 38 patients who had reached after 60 minutes (38%). A total of 14% patients reached within 30 minutes. Both these tests APTT and PT are used as measure for clotting pathways in blood. A total of 68 % of the patients had prolonged prothrombin time and a total of 64% patients had prolonged Activated partial thromboplastin time. There was statistical significance between development of complications and prolonged activated partial thromboplastin time, prolonged prothrombin time as P value < 0.01.

**Conclusion:** Present study concludes that there is a significant correlation of prolonged Prothrombin time and Activated Partial Thromboplastin time with morbidity and mortality in patients with alleged history of snake bite and treating physicians should monitor such patients carefully in order to prevent complications associated with it.

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## 1. Introduction

Snake bite is a most common life threatening medical emergency and a high incidence of snake bite is reported from rural area. But due to inadequate epidemiological data the incidence is underestimated.<sup>[1]</sup>

Venomous animals account for much morbidity and mortality. Worldwide, it is estimated that more than 5 million persons per year are bitten by snakes, out of which approximately 100,000 develop severe sequelae.<sup>[2, 3]</sup> The actual figure may be much more since in India alone the mortality is suggested to be around 30,000.<sup>[4]</sup> The main aim of this study is to analyse outcome of patients with alleged history of snake bite with respect to coagulation parameters activated partial thromboplastin time and prothrombin Time.

## 2. Material And Methods

Present study was a single center hospital based prospective, observational descriptive study. Conducted in patients admitted to Medical Intensive Care Unit of Krishna Institute Medical Sciences, Karad, over a period of 18 months from November 2020 to April 2022. Total 100 cases were studied.

### Inclusion Criteria :

- Patients with history of alleged snake bite are included in this study

### Exclusion Criteria :

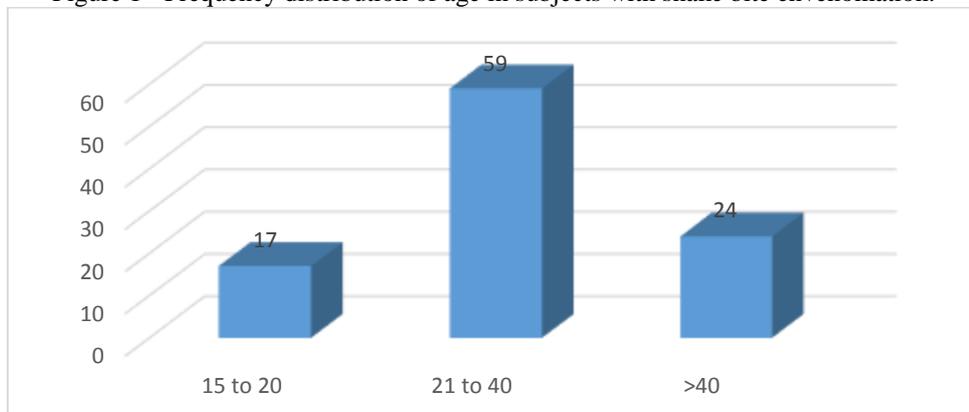
- Patients with pre-existing coagulopathy, on anti coagulant drugs, pre existing liver disease are excluded from this study

The selected study subject was interviewed & examined. A detailed history was taken in each patient in relation to their name, age, sex, address, occupation, etc. Snake bite induced coagulopathy among hospitalized patients in relation to activated partial thromboplastin time and prothrombin time was evaluated in each patients. Data analysis: The collected data was compiled in Microsoft Excel 2010. Data describing quantitative measures was expressed as mean, median, mean + SD, standard deviation.

## 3. Results

The mean age of study population was  $32.2 \pm 11.6$  years, ranging from 17 to 64 years. A majority of patients belonged to age group of 21-40 years (59%). A total of 24% were in age group more than 40 years age, while 17% were in age group 15-20 years.

Figure 1 - Frequency distribution of age in subjects with snake bite envenomation.



A total of 48 patients had reached the hospital within 30 to 60 minutes (48%). There were 38 patients who had reached after 60

minutes(38%). A total of 14% patients reached within 30 minutes.

Table 1 – Frequency distribution of bite time to presentation in subjects with snake bite envenomation.

Bite time to presentation	Number of subjects (n=100)	Percent
Within 30 min	14	14
30 min to 60 min	48	48
>60 min	38	38
Total	100	100

Out of the total 100 cases, majority snakes identified were Viper, which was seen in 80%

cases. The second most common was Cobra, which was seen in only 15% cases. The least commonly

observed was Krait, which was seen in only 5% cases.

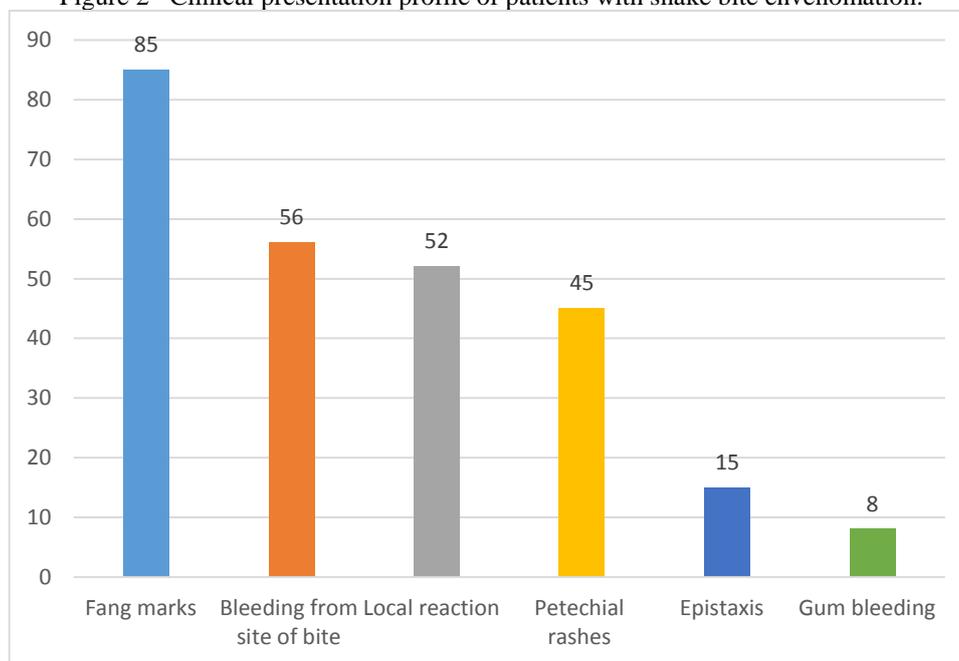
Table 2: Distribution of the identity of snake.

Snake	Number of subjects (n=100)	Percent
Viper	80	80
Cobra	15	15
Krait	5	5
Total	100	100

Most commonly patients came with fang marks over the site of bite, about 85% had fang marks over the site. A total of 56% of the patients presented with bleeding from the site of bite, about 52% patients had local reaction around the site of

bite and over the limb involved. A total of 45% patients had petechial rashes over the body. There were 15% patients who came with epistaxis and a total of 8% patients had gum bleeding. So the most common presentation was fang marks.

Figure 2– Clinical presentation profile of patients with snake bite envenomation.



Both these tests APTT and PT are used as measure for clotting pathways in blood. A total of 68% of the patients had prolonged prothrombin time and a

total of 64% patients had prolonged Activated partial thromboplastin time.

Table 2 - Activated Partial Thromboplastin Time and Prothrombin Time levels in subjects with snake bite envenomation.

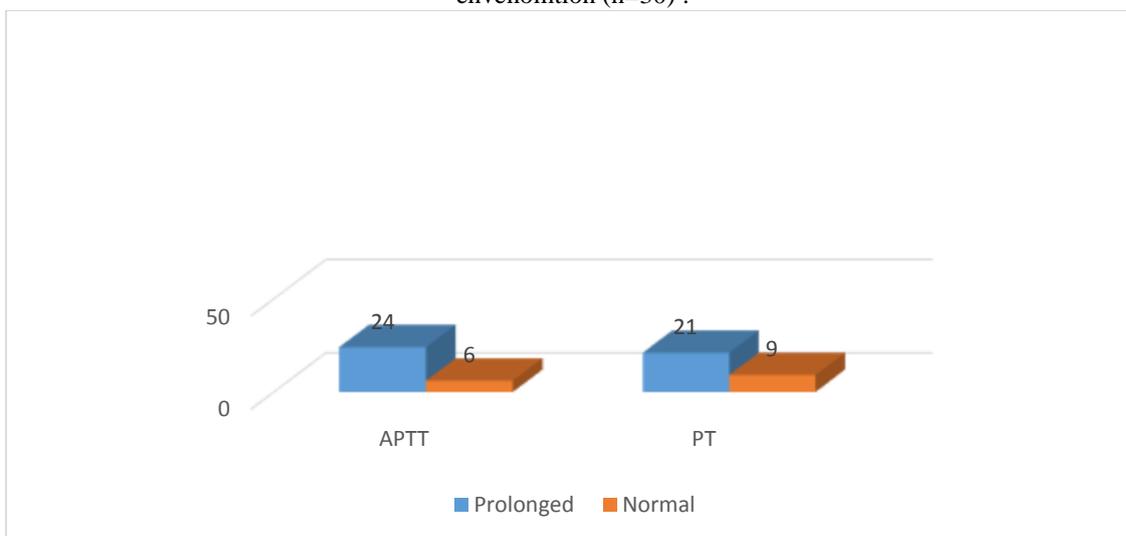
Parameter	Number of subjects (n=100)	Percent
Prolonged APTT	64	64
Prolonged PT	68	68

Out of 30 patients 24 patients had prolonged activated partial thromboplastin time at presentation (80%) while 6 patients had normal activated partial thromboplastin time at presentation (20%).

A total of 21 patients had prolonged prothrombin time at presentation(70%) while 9 patients had normal prothrombin time at presentation (30%). There was statistical significance between development of complications and prolonged

activated partial thromboplastin time, prolonged prothrombin time as P value < 0.01.

Figure 3 – Activated partial thromboplastin time and Prothrombin time in complicated patients with snake bite envenomtion (n=30) :



#### 4. Discussion

Mean age was  $32.2 \pm 11.6$  years, ranging from 17 to 64 years. Majority of cases were in age group of 20-40 years (59%), 24% were >40 years and 17% were < 20 years. Study by Pongpit et al <sup>[5]</sup> showed that mean age was 46.1 year. Study by H S Harshavardhana et al <sup>[6]</sup> showed that 58% cases had age >40 years. Study by Dang XT et al <sup>[7]</sup> showed that mean age was  $41.27 \pm 14$  years.

In present study majority 48% reached hospital in 30 to 60 min, 38% in >60 min and 14% within 30 min and among complicated cases 90% had >60 min, 10% had 30 to 60 min. Study by H S Harshavardhana et al <sup>[6]</sup> showed that only 10% cases reached within 10-30 min. Study by Dang XT et al <sup>[7]</sup> showed that 26.8% cases reached hospital after 6 hours.

In present study most common snake was 80% viper, 15% cobra, 5% krait. Vipers are most commonly seen in India. Study by H S Harshavardhana et al <sup>[6]</sup> showed that viper bite 70% was most common. Study by Dang XT et al <sup>[7]</sup> showed that viper bite was most common.

In present study most commonly patients came with fang marks over the site of bite, about 85% had fang marks over the site. Study by H S Harshavardhana et al <sup>[6]</sup> showed that 33 patients (66%) had fang marks, 20 patients had bleeding from the bite site (40%), 7 patients had bleeding gums (14%), 20 patients had hematuria (40%), swelling and inflammation of the bite area was present in 45 patients (90%), 62% had tachycardia. Prolonged APTT was seen in 64% and Prolonged PT in 68% cases. Among complicated cases majority 80% had prolonged APTT and 70% had

prolonged PT. Study by Dang XT et al <sup>[7]</sup> showed that 17.1% had prolonged APTT and PT in 39%.

#### 5. Conclusion

Prothrombin time and Activated Partial Thromboplastin time act as good markers for predicting the outcome in patients with snake bite. Such test should be involved in standard treatment protocol, which will help the clinicians to treat the snake bite patients.

Present study concludes that there is a significant correlation of prolonged Prothrombin time and Activated Partial Thromboplastin time with morbidity and mortality in patients with alleged history of snake bite and treating physicians should monitor such patients carefully in order to prevent complications associated with it.

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