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A STUDY OF COAGULATION PROFILE IN SNAKE BITES

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Abstract

Introduction: A interesting aspect of nature are snakes. Their appearance, motion, and they appear more mysterious than other animals due to their hidden behaviours. Snakes are an excellent introduction to wildlife of the natural world. The world's snake species are over 3000 of these more than 200, with sizes ranging from worms that are 100 mm long to snakes up to 6 m length in India. Most of the parts in India have snakes of Environments range from swamps, lakes, and deserts to warm oceans, and up into the mountains were farmlands. These predators are crucial to the preservation of the ecosystem.

Materials and Methods: Between July 2021 and October 2022, the Government General Hospital, Ananthapuram, l undertook this investigation. The chosen patients were among those who had been admitted to the general hospital wards after suffering a snake bite. Patients who reported having been bitten and who also had symptoms that were judged to be suggestive of a viper bite, such as local cellulites, regional lymphadenitis, and/or prolonged clotting time, were taken into consideration for the study. Patients exhibiting neurotoxic symptoms were not taken into consideration for the study. Again, patients with localized edoema brought on by the use of a tourniquet and local native therapy were not taken into consideration for the study.

Results: October 2022 with a history or physical characteristics indicative of a snakebite. 64 of the 147 patients displayed characteristics that would point to a hemostastic aberration. 7 patients mostly displayed neurotoxic symptoms. Hemostatic and neurotoxic abnormalities was present in one case. The remaining 75 individuals lacked any envenomation-related symptoms. Another 117 individuals were handled as possible bites from unknown reptiles. Therefore, out of 147 individuals treated with either a history of or clinical signs suggestive of a snake bite, 48.9% were poisonous and 51.1% were not. Among those who had been bitten by poison, 89% exhibited primary coagulation abnormalities, 9.7% had neurotoxic manifestations, and 1.3% had both. 48 patients were randomly chosen from the 64 patients who were admitted and had signs of primary hemostatic disruption for the study. The patients in our study ranged in age from 13 to 65, with an average age of 38 years.

Conclusion: The most frequent type of snake bite poisoning observed in this investigation was hemotoxic envenomation. Most bites primarily affected the lower limbs. Krait was the most toxic snake (in terms of fatality), whereas Saw-Scaled Viper was the most prevalent snake causing coagulation abnormalities. The most frequent type of systemic bleed seen was gum bleeding. Local symptoms and a prolonged clotting time demonstrated a 100% sensitivity for diagnosing hemotoxic envenomation. The main cause for the coagulation abnormalities appears to be diffused intravascular coagulation. Since bleeding times were consistently typical and platelet counts were only moderately reduced in the majority of instances, mucosal bleeding was most likely caused by hemorrhagin's direct vasotoxic action.

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Key Words: Snakes, local cellulites, regional lymphadenitis, hemotoxic envenomation, mucosal bleeding

INTRODUCTION

A interesting aspect of nature are snakes. Their appearance, motion, and they appear more mysterious than other animals due to their hidden behaviours. Snakes are an excellent introduction to wildlife of the natural world. The world's snake species are over 3000 of these more than 200, with sizes ranging from worms that are 100 mm long to snakes up to 6 m length in India. Most of the parts in India have snakes of Environments range from swamps, lakes, and deserts to warm oceans, and up into the mountains were farmlands. These predators are crucial to the preservation of the ecosystem.[1]

India has a known for being home to unusual snakes. From olden days, snakes have been revered in this region as gods. Freshly caught cobras are still worshipped with flowers, ghee, and cash at the harvest festival known as "Nag chavithi" in Andhra Pradesh. The majority of us run away when we see a snake. But some people have made a life off of these extinct creatures. The Irula tribal people of south India have provided millions of snake skins for export over the years. Since this trade is currently prohibited, people catch snakes for the purpose of extracting their venom, which is then utilised to make anti-venom.[2]

Snakebites are a frequent emergency that doctors deal with on a daily basis. In tropical and subtropical nations, morbidity and mortality from snakebites are preventable public health risks. Snakebites are a significant public health issue in India because of the country's climate and the country's large rural and agrarian population. in India, out of 200,000 snake bites, 15,000 people pass away each year.[3]

The mortality rate is about 7.5% according to hospital statistics. But, in reality, the majority of rural patients choose to receive their care from traditional healers and avoid going to hospitals.[4]

It is true that a cobra bite can result in death within minutes to hours; however, if treated promptly with antisnake venom, a patient can quickly recover. Death happens over several days in the more frequent instance of viper bites.[5] The morbidity rate is considerable even in the absence of death. These elements demand intensive and targeted therapy. There is still much debate on the management of snake bites and their impact on the hematopoietic system. Our institute is located in a predominantly rural area with a high influx of cases, especially snake bites, hence we have chosen a study on these haematological effects and response to treatment.

AIMS OF THE STUDY

1. To evaluate the modifications to the coagulation profile after a snake bite.
2. To list the snake species that frequently induce coagulation abnormalities.
3. To research the typical types of systemic bleeding in victims of snakebite.
4. To examine the intervals of time between the snake bite and the start of aberrant coagulation profiles.

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5. To link the anomalies of quantitative coagulation testing to clinical severity.
6. To examine the time needed for the return of the normal coagulation profile following anti-snake venom medication.
7. To know the coagulation abnormalities, their reversal, and the time lag of the bite and the start of treatment are correlated.
8. To know the renal failure and a changed coagulation profile are related.

MATERIALS AND METHODS

Study Population: Between July 2021 and October 2022, the Government General Hospital, Ananthapuram, l undertook this investigation. The chosen patients were among those who had been admitted to the general hospital wards after suffering a snake bite.

Criteria for Selection

Patients who reported having been bitten and who also had symptoms that were judged to be suggestive of a viper bite, such as local cellulites, regional lymphadenitis, and/or prolonged clotting time, were taken into consideration for the study. Patients exhibiting neurotoxic symptoms were not taken into consideration for the study. Again, patients with localised edoema brought on by the use of a tourniquet and local native therapy were not taken into consideration for the study.

Initial Investigation: Routine haemoglobin, total and various WBC counts, urine deposits, blood sugar,urea, and serum creatinine were all estimated for all instances.

GRADE OF SERIOUSNESS: Patients received the following grades:

Grade I: Localized cellulitis, localised lymphadenitis, and normal clotting time.

Grade II: Long clotting time plus regional characteristics.
Grade III: Systemic bleeding combined with a protracted clotting time

20min WHOLE BLOOD COAGULATION TIME

Although there are many ways to measure clotting time (the normal by Lee and White is 6- 9 minutes, by Dale & Laid is 3-5 minutes), the Ulans method was used for our study for practicality. This procedure involved keeping two cc of blood in a pyrex test tube undisturbed (10cm tall and inside diameter 1cm). The test tube was gently turned to 45 degrees after 5 minutes to check for clotting. The process was carried out minute after minute until the blood clotted. By using this approach, the typical clotting time was between 9 and 15 minutes. 35 As previously mentioned, the samplewas left behind to evaluate the clot quality.

BLEEDING TIME

Duke's approach was used to estimate the bleeding time. Here, the tip of the finger was pricked with a needle about one centimetre deep, and the blood was blotted out. It was documented how

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long it took the bleeding to stop. 3 to 5 minutes is the usual range.

PLATELET COUNT

Brilliant cresyl blue was the stain used, and it was made by combining 0.3 g of the crystals with one drop of formalin and 100 millilitres of distilled water. Blood was drawn up to the 0.5 reading using an RBC pipette, then brilliant cresyl blue solution (1 in 200 dilution) was added until the 101-point mark. After being left for two minutes, it was charged into a neubars chamber using a cover slip. The dots that made up platelets were blue pink. Usually between 1.5 and 3 lakhs/cubic millimetre.

COAGULATION PROFILE TEST: BLOOD COLLECTION & PROCESSING

A veinous blood was taken and combined with 3.8% aqueous trisodium citrates in a ratio of 9:1 respectively. 1.8 ml of blood and 0.2 ml of sodium citrate, for example. Blood was delivered right away to the lab. In the event of a delay, the samples were kept in a freezer at 4°C. Centrifugation at 3000 rpm was carried out in the lab for 5 minutes. The following tests were performed using the resultant sample. Blood samples from controls were likewise drawn and processed similarly. Before anti- snake venom was administered, samples were obtained. After anti-snake venom administration, samples were obtained in a few carefully chosen patients.

PROTHROMBIN TIME

Although the test was formerly believed to measure prothrombin, it is now known to also depend on responses to factors V, VII, and X as well as fibrinogen levels.
Prothrombin time is hence an inaccurate name. The efficiency of the extrinsic pathway is assessed by this test.

Plasma from the patient and a control group were used for the test. 0.2 ml of Liquiplastin reagent (thromboplastin) was added after 0.1 ml of plasma in a glass tube was submerged in water at 37°C for 3 to 5 minutes.

It was noticed how long it took for the sample to clot. The usage of the thromboplastin affects normal readings. The average is 10 to 14 seconds longer thanthe target value.

ACTIVATED PARTIAL THROMBOPLASTIN TIME

With the exception of factors VII and XIII, this test examines coagulation factor abnormalities. It is particularly sensitive to early intrinsic pathway stages. Liquicelin reagent solution was combined with 0.1 ml of test plasma for 3 minutes at37°C in a water bath. Calcium chloride was warmed up to 0.1 ml before being added, and a stopwatch was started and its end point recorded. Normal values should be 6 seconds longer than the control value. Anything over 10 seconds is unnatural.

THROMBIN TIME

0.2 ml of Plasma from the sample was incubated for two minutes at 37°C. The thrombin time reagent (0.1 ml) was added, and the stopwatch was started. We measured the clotting time. With patient plasma and control plasma, the test is repeated in two test tubes. Anything above 20 seconds is inappropriate. Within 2seconds of the control value should be the patient's value.

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FIBRIN DEGRADATION PRODUCT

Dimertest II latex reagents coated with mouse monoclonal Anti-D dimmer antibody were the substance used in this test. We prepared several dilutions of the test plasma. 100 microliters of phosphate buffer solution and 100 microliters of plasma were combined to create a 1:2 dilution. In order to achieve a 1:4 dilution, 100 microliters of a 1:2 dilution solution were added to 100 microliters of phosphate buffer solution. To reach the necessary dilution, this operation was repeated. Twenty microliters of plasma were added to each of the diluted solutions and combined with the reagent solutions. Slide was gently turned for three minutes. Agglutination is evaluated for after 3 minutes. A titre is determined by the highest dilution at which visible agglutination appears.

RESULTS

TITRE	APPROXIMATE XL-FDP LEVELS (mg/1)	UNDILUTED	SAMPLE DILUTION 1:2	SAMPLE DILUTION 1:4	SAMPLE DILUTION 1:8
0	Normal	-	-	-	-
1	- 0.25 – 0.5	+	-	-	-
2	0.5 – 1	+	+	-	-
4	1 – 2	+	+	+	-
8	2 – 4	+	+	+	+

It is not anticipated that plasma from healthy people will agglutinate.

FIBRINOGEN

Reagents employed 1) Ammonium sulphate, which contains 1g of sodium chloride and 13.3g of ammonium in 100ml of distilled water. You can change the pH by adding 10N NaOH. 2) Regular saline, which has 9 mg of NaCl/ L of water.

TEST: 0.5 ml plasma and 0.5ml Normal saline added to 9ml of ammonium sulphatesolution.

BLANK: 1ml of normal saline added to 9ml of Ammonium sulphate Shake for five minutes, then read through a 420 filter.

Blood fibrinogen in milligram% (normal 200–400 mg%) is the result of the test.

RESULTS

General Characters

Between July 2021 and October 2022, 98 patients in total were admitted to the general medical wards at Government general Hospital, Ananthapuram.

October 2022 with a history or physical characteristics indicative of a snakebite. 64 of the 147 patients displayed characteristics that would point to a hemostasticaberration.

7 patients mostly displayed neurotoxic symptoms. Hemostatic and neurotoxic abnormalities was

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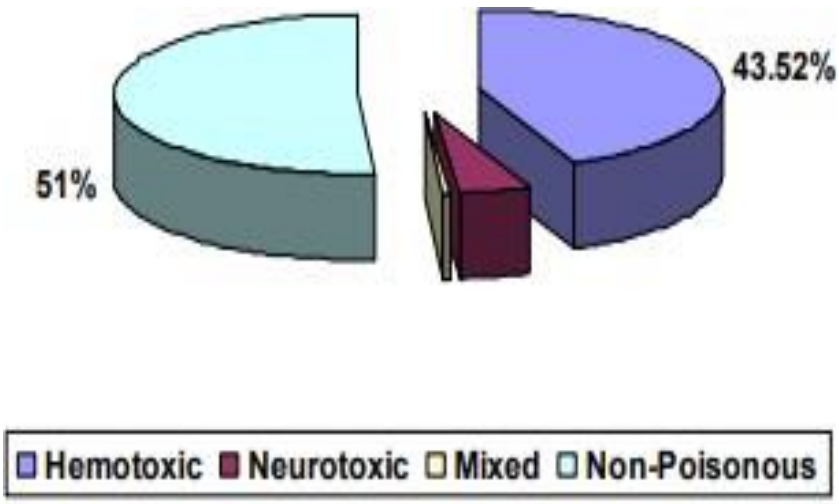
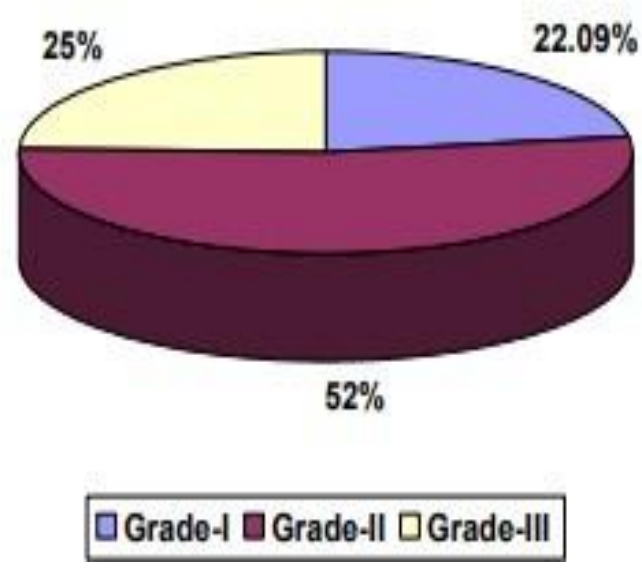
present in one case. The remaining 75 individuals lacked any envenomation-related symptoms. Another 117 individuals were handled as possible bites from unknown reptiles. Therefore, out of 147 individuals treated with either a history of or clinical signs suggestive of a snake bite, 48.9% were poisonous and 51.1% were not. Among those who had been bitten by poison, 89% exhibited primarycoagulation abnormalities, 9.7% had neurotoxic manifestations, and 1.3% had both.

48 patients were randomly chosen from the 64 patients who were admitted and had signs of primary hemostatic disruption for the study. The patients in our study ranged in age from 13 to 65, with an average age of 38 years.





According to clinical characteristics and clotting time, the study population was divided into

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three categories: Grades I, II, and III. 11 patients were in Grade I, 25 were in Grade II, and 12 more were in Grade III (22%, 54%, and 24%), respectively. Numerous tests to evaluate coagulation parameters were performed on these patients. The majority of the patients (63.6%) experienced a bite on a lower limb.

36.4% of bites occurred on the upper limb. The hospital stays of those who had been bitten by snakes and had clotting abnormalities ranged from 3 to 31 days, with an average of 6 days.

ASSESSMENT OF CHANGES IN COAGULATION PROFILE:

Blood was drawn from patients who had clear signs of envenomation at the time of admission prior to beginning treatment, with the exception of neurotoxic symptoms.

1. **Clotting Time**: 76% of the 48 study participants had delayed clotting times at the time of admission. Another 3 instances (6.2%) had clotting times that were normal upon admission but turned abnormal within 4 to 12 hours. Consequently, 82% of the patients overall had a delayed clotting time.

2. **Bleeding Time**: Of the 48 total cases, forty had their bleeding time examined. It was discovered to be normal in every instance, even in instances where systemic bleeding had shown up as haematuria, haematemesis, and hemoptysis. It was discovered that the bleeding took 2 to 6 minutes on average.

3. **Platelet Count**: In all cases belonging to Grades II and III, it was discovered that the platelet count had decreased. There were 97,486 cells/cumm on average in the platelet count. There was a 100% reduction as a result. In Grade I, there were on average 2.3 lakh students.

4. **Prothrombin Time**: The main purpose of this test is to detect any abnormalities in the extrinsic route. In ten of the eleven cases, it was carried out. Prothrombin time was measured in Grade II instances 21 out of 25 and Grade III cases 10 out of 12. Prothrombin time prolongation in all of these individuals indicated a 100% positive result. After forty-eight hours, the PT level in patients who had received anti-snake venom therapy had returned to baseline. grade I [i.e., local features with a regular clotting time]. With the exception of one patient, all test results were normal. This grade I patient had a prolonged prothrombin time and over the course of six hours developed an aberrant coagulation profile. Two additional individuals who shared a clinical condition with them displayed normal prothrombin times.

5. **Activated Partial Thromboplastin Time (APTT**): This test is used to determine whether the intrinsic route is faulty in any way. Except for one patient who later went on to develop abnormal coagulation characteristics, tests in 10 out of 11 cases in Grade I were normal. Twenty individuals in Grade II and ten in Grade III underwent lengthy testing. Therefore, in individuals belonging to Grades II and III, the test was 100% positive. APTT was discovered to be prolonged for up to 48 hours after ASV therapy.

6. **Thrombin time:** Eight patients of Grade I envenomation underwent this test. It was normal in every instance, even in patients whose PT and APTT were prolonged and who later experienced aberrant coagulation. Tests were administered in 20 out of 25 and 10 out of 12 cases for grades II and III, respectively. They displayed the same 100% prolongation as PT and APTT. Within 48 hours, the test was back tonormal.

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7. **Fibrin degradation products**: This test determines whether fibrinolysis is an initial or subsequent occurrence. This was done for six Grade I instances, and none of them had any indication of fibrinolysis. In 16 cases of grade II, a dilution of 0.5 mg produced positive results in 64.9% while a dilution of 1 to 2 revealed positive results in 35.1% of the cases. The test was thus entirely positive. Eighty percent of grade III patient tests (5 out of 12) showed positive results in dilutions of 0.5 to 1, followed by 20% in dilutions of 1 to 2 mg. the test was once more 100% positive.

8. **Plasma fibrinogen** was calculated for each patient. Patients in Grade I displayed an average level of 245.5 mgs (normal range: 200 to 400 mg/dl). The average grade II fibrinogen level was 166.7 mg, and the average grade III level was 143.9 mg. As a result, the fibrinogen levels in Grade II and III categories were reduced by 100%.

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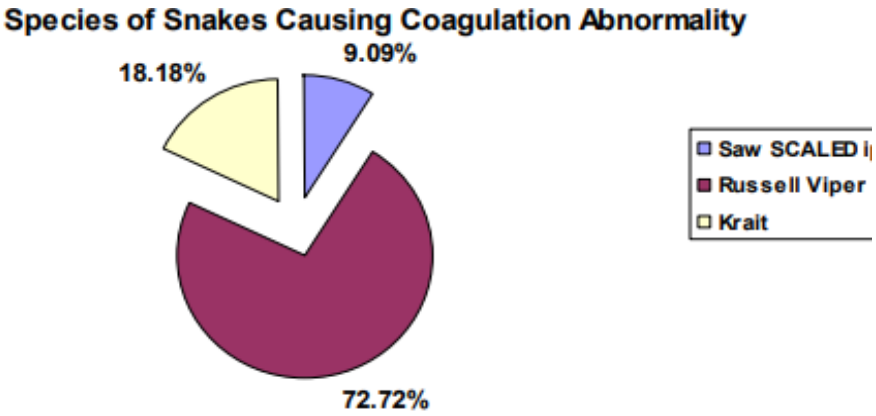

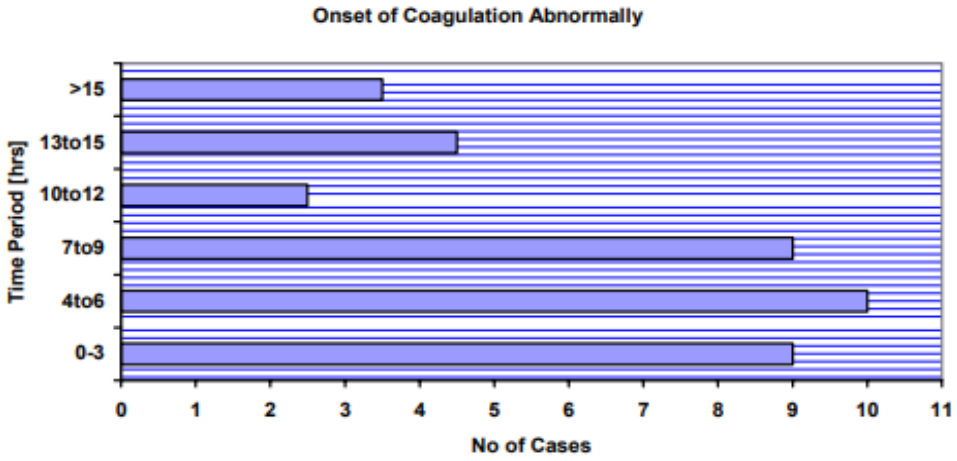

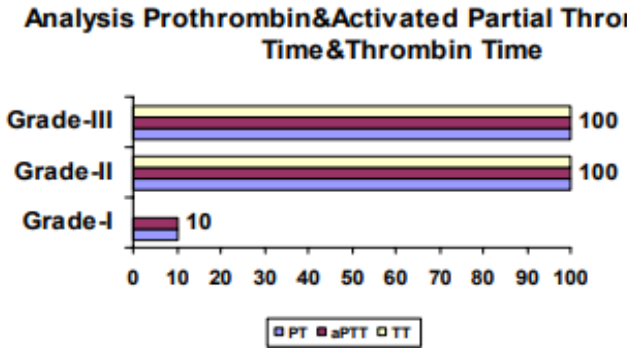

RELATIONSHIP BETWEEN COAGULATION ABNORMALITY AND SNAKE TYPE:

When the snake was killed and brought to the hospital in 11 out of 48 patients (23%) it could be identified. Based on a clinical review, the bite that the 77% of people received was afterwards treated as a snake bite. 72% of the patients who were able to identify the snake reported seeing a scaled viper bite. One patient who passed away had been bitten by a Krait, and 18.3% of people identified the snake as a Russell viper.

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SYSTEMIC BLEEDING MANIFESTATION ANALYSIS IN INDIVIDUALS BITTEN BY SNAKES:

Out of 48 individuals, 12 had extensive bleeding. Out of them, 33.33% had hemorrhagic cysts, 58.3% had gum bleeding, 25% had hemoptysis, 8.3% hadhemetemesis, and 8.3% had epistaxis.

A TIME ANALYSIS OF THE DELAY BETWEEN A SNAKE BITE AND THE START OF COAGULATION ANORMITY:

Based on two sets of results, the timing of the onset of aberrant coagulation was examined. The first was determined by the proportion of patients who had a prolonged clotting time at the time of admission. At the time of admission, 77% of the patients exhibited abnormal clotting times. The interval between the bite and hospital admission ranged from 2 to 12 hours, with an average of 7.15 hours.

Three patients in the second group under analysis had normal clotting times at admission but over time developed abnormal ones. The illness struck two of them in a matter of six hours, and the third sufferer in a matter of twelve. Thus, it was shown that the majority developed aberrant coagulation in an average of seven hours, while it might start as early as two hours or as late as twelve hours.

The PT, TT, and FDP were all prolonged in all patients who had a prolonged clotting time at arrival. One patient who initially had normal clotting time but later developed aberrant coagulation had initially extended PT and APTT.

Association of Clinical severity and quantitative coagulation tests :

The relationship between the clinical severity and three quantitative tests—the FDP, platelet count, and fibrinogen—was examined.

All grade I patients' FDP results were negative. The test was positive in 0.5 to 1 cases and 1 to 2 cases in grade II patients, respectively. In grade III, a dilution of 0.5 to 1 produced a positive result for 80% of the students and a dilution of 1 to 2 for 20%. Therefore, it may be said that the clinical severity assessment and FDP level did not correlate.

All patients in Grade I had normal platelet counts, with an average of 2.3 lakh/cumm. Individuals in grades II and III had an average platelet count of 1.01 lakh/cumm and 90,400/cumm, respectively. As a result, even though all snake bite victims had lower platelet counts and coagulation abnormalities, the severity of envenomation was notrelated to this.

The average amount of blood fibrinogen in patients of grade I showed no decline and was 245 mg/dl. Patients in grades II and III had average levels of 166 mg/dl and 143 mg/dl, respectively. As a result, it was discovered that the serum fibrinogen level decreased with the degree of envenomation.

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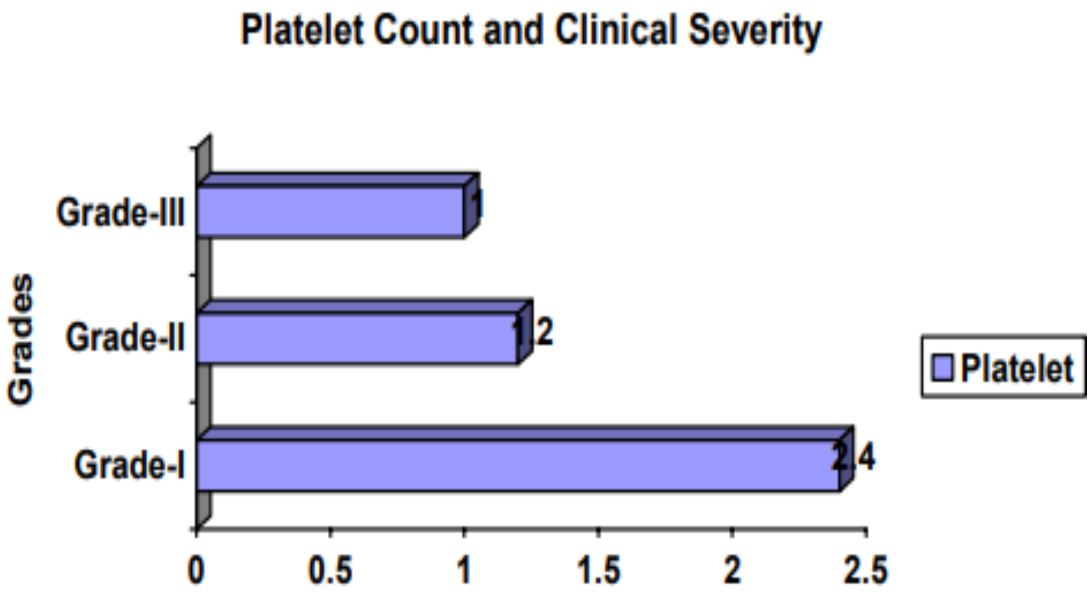

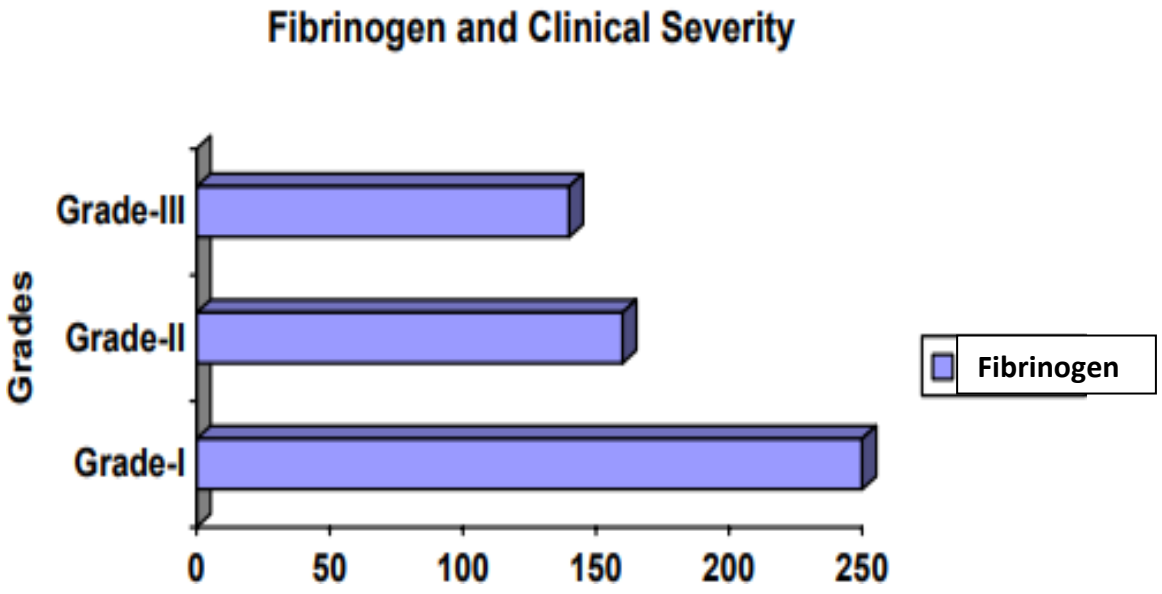

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A TIME ANALYSIS OF THE COAGULATION PROFILE'S RETURN TO NORMAL

In grades II and III, the length of time it takes for clotting time to return to normal was examined. A fixed ASV regimen was employed for optimal uniformity. Clotting time was repeated every two hours and, in some circumstances, more frequently. In grade II, it took an average of 7.9 hours for the clotting time to return to normal.

It ranged from two to twenty-one hours. Clotting time normalisation took an average of 18 hours in grade III patients, with a range of 4 to 24 hours. Individuals in grades II and III required an average dose of ASV of 13.8 vials (5 to 40), and 15.5 vials (10 to 30 vials).

Four patients with normal clotting times at admission were evaluated to see how long it took for their PT, APTT, TT, FDP, fibrinogen, and platelet counts to return to normal after receiving ASV therapy. This process was initially slowed when the patients weretreated in outlying hospitals.

Two individuals who underwent the test at 48 hours later had aberrant PT, APTT, and TT results as well as fibrinogen FDP and platelet counts. Only FDP fibrinogen and platelet were abnormal in the tests performed on the third and fifth days for two additional patients. PT, APTT, and TT were back to normal. Therefore, it was discovered that the average time required for PT, APTT, and TT normalisation was 48 hours, whereas the time required for platelet count FDP and fibrinogen normalisation was longer.

ANALYSIS OF RELATIONSHIP BETWEEN THE TIME OF BITE, INITIATION OF THERAPY, RETURN OF COAGULATION PARAMETERS TO NORMAL AND THE DEVELOPMENT OF COMPLICATIONS.

TIME TO ONSET OF TREATMENT (HOURS)	GRADE	NUMBER OF CASES	NUMBER OF CASE RENAL FAILURE	RETURN OF CLOTTING TIME TO NORMAL	AVERAGE NO OF ASV
0-5	G II	10	-	8.8	14.5
	GIII	3	-	9	15
5-10	G II	8	2	8.7	14.5
	G III	5	1	11.6	17
10-15	G II	4	2*	10	10.5
	G III	2	1	11	11.5
> 15	G II	3	1*	7	8
	G III	2	1	20	15

** (PATIENTS ADMITTED WITH ESTABLISHED RENAL FAILURE TREATED OUTSIDE TMCH)

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Analysis of the aforementioned table makes clear that among patients receiving hospital treatment, the timing of the start of therapy correlates with the emergence of problems. It has been determined that renal failure occurs at a rate of if delayed, high.

The amount of time between the bite and the start of treatment, as well as the degree of envenomation, are related to the recovery of clotting time to normal after therapy with ASV.

RENAL FAILURE INCIDENCE ANALYSIS IN RELATION TO COAGULATION PROFILE ALTERATION:

Renal failure affected 19% of the study population overall, with 11% of cases falling into grades I, II, and III, respectively. Renal failure patients in grade I had a normal coagulation profile.

The majority of renal failure (55%) was grade II, although it's vital to note that three out of the five patients in this group who experienced renal failure also experienced the condition prior to being admitted to Government General Hospital, Ananthapuram. In the outlying centre, they had been treated with low dose ASV (on average 5 vials). Only two of the twenty two grade II patients experienced renal failure while receiving hospital treatment. Only 9% of people who were treated in hospitals and who had renal failure at the time of admission went on to develop Grade II renal failure. In these patients, the average FDP level ranged from 0.5 to 1 mg/dl. The average fibrinogen level was 185 mg/dl, and the platelet count was 1.2 lakhs per cumm.

Despite receiving hospital care, 3 out of 12 patients (about 25%) in grade III experienced renal failure. Two individuals had FDP levels between 0.5 and 1, and one had one between 1 and 2 mg/dl. The average fibrinogen level was 124 mg/dl and the platelet count was 85,000/cumm. While one patient received conservative care, three patients in grade II received peritoneal dialysis in one session. Two patients in grade III received conservative care, whilst one required peritoneal dialysis twice.

In conclusion, renal failure among patients receiving hospital treatment was associated with the severity of envenomation. Similar to severity, fibrinogen level linked better than platelet count and FDP with the onset of renal failure.

DISCUSSION

EPIDEMIOLOGICAL ASPECT

A very fertile region is the Andhra pradesh, which includes Ananthapur and the surrounding districts. Agriculture has been the main line of workfor the local population for many generations.

There has been a consistent high incidence of snake bite cases coming to our institution over the past few years due to the quantity of agriculture, which is the natural habitat of snakes like the viper. We conducted a study on the coagulation failure following snake bite because the most frequent presentation of these has been with hemostatic abnormalities.[6]

An analysis of hospital statistics for the years 2021 to 2022 showed that the monsoon season had the highest number of admissions of cases. So, this investigation was carried out 147 cases involving snake bites were admitted overall during this time. 48.9% of them displayed signs of

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envenomation. 9.7% were neurotoxic, 8% were hemotoxic, and 1.3% possessed a mixed kind. Only 50 of India's 236 snake species are toxic, according to common knowledge. Snakes like the krait, cobra, saw-scaled viper, and russell viper are frequently seen.[7]

Considering these, the incidence of envenomation must be minimal in comparison to the total number of bites. According to our study, 48.9% of snake bite patients developed envenomation-related symptoms. This high prevalence could result from the likelihood that many non-poisonous snake bites have a local hospital for treatment or, if directed here, may have categorised separately as an unidentified reptile bite.

As previously indicated, the viper, which is the most problematic snake, may be to blame for the higher proportion of patients presenting with hemostatic abnormalities (89%) compared to the neurotoxic group (9.7%). (farmlandhabitat).[8]

In our study, there were 63.3% of patients with bites on the lower limb and 36.7% on the upper limb. As demonstrated by Sawai in 1974 (lower limb bites: 72%; upper limb bites: 25%; other parts: 3%), this was consistent with prior research.

In our study, a hospital stay lasted an average of 6 days (range – 3 to 31 days). The development of complications including renal failure and gangrene as a result of compartmental syndrome was one of the factors contributing to the prolonged hospitalisation.

COAGULATION PROFILE CHANGES NOTICED.

CLOTTING TIME

In every instance of confirmed envenomation, the clotting time was 100% prolonged according to Reid's study[11]. 95% of participants in the Orisa research had a long clotting time. 30 of these 6% underwent aberrant development 6 to 12 hours after admission. This highlights the fact that local lymphadenitis and cellulitis are crucial indicators of a snake bite.

ASV treatment may also be required for individuals with local characteristics but normal clotting times since they may subsequently develop coagulation abnormalities, as in 6% of our cases, or other consequences such acuterenal failure (one case in our study).

Even though 3 patients had no local symptoms, prolongation alone is not a completely accurate sign of hemotoxic envenomation. Clotting time was taken into account along with local factors, which considerably boosted specificity (especially viper bite).

BLEEDING TIME

Only 10% of participants in the Orissa research had prolonged bleeding times. Reid reported a 5% incidence rate. None of the participants in our study, included Systemic bleeders experienced very long bleeding times. We conclude that Platelet irregularity may be a contributing cause, but it is not the only one. Principal reason for bleeding count of platelets Reid and Mohapathra's studies (in Orissa) revealed a 95% and 93% decrease in platelet count. respectively.[9]

According to Saini et al., 10% of reduced platelet counts. In every case, we noticed a lower platelet count. (Average count: 97,486/cu mm), with a protracted clotting time. However No meaningful correlation with severity was found. Even those who are relatively mildly elevated levels of mucosal bleeding (hematuria, hemetemesis) decreases in platelet counts (not sufficient to

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cause spontaneous bleeding) with typical bleeding intervals. As a result, we draw the conclusion that the direct vasotoxic toxin "hemorrhagin" must play a significant role in generating mucosal bleeding.

Thrombin, prothrombin, and activated partial thromboplastin timings.

In the Orissan research, the thrombin time, prothrombin time, and activated partial thromboplastin time were all prolonged. Reid's study found that 30 PT and TT were prolonged in every instance. Even in the 5% of instances where the clotting time was normal, the test was found to be prolonged. In our investigation, only one out of eleven patients (9%), who had normal clotting times, had their test delayed. This was true in all cases of grades II and III envenomation (i.e., those with prolonged clotting times). The key result was that this case was one of the three that continued to experience prolonged clotting.

later in time. PT, APTT, and TT have all demonstrated prolongation with longer clotting time, as in earlier investigations, demonstrating that the venom equally activates intrinsic and extrinsic mechanisms.

In all instances in the Orissan study30, the test was delayed in patients with normal clotting times, but in our situation, only one patient in this category displayed similar outcomes, and this patient eventually developed abnormal clotting patterns. It has been noted that PT and APTT are prolonged below a value of 6% of normal themselves, although the clotting time may be normal even when clotting factors in the blood are at 1% of normal amount 37. This shows that the later tests pick up hemotoxicity earlier; however, more extensive research involving a larger sample size of patients is required to confirm this. In our investigation, it was discovered that the normalisation of these tests took an average of 48 hours.

Fibrin degradation products (FDP)

Even when other signs of envenomation were present, the amount of fibrin degradation products (FDP) increased in all cases where the clotting time was prolonged but not in the group with normal clotting times. According to the Orissan study, all of the patients exhibited elevated FDP. [30]. The degree of envenomation was not correlated with FDP levels. Therefore, the mechanism causing the lengthening of the clotting time and the subsequent problems in snake bites is fibrinolysis (either primary or secondary).

Fibrinogen

All patients in Grades II and III had lower blood fibrinogen levels than normal (average values of 166.7 mg% and 143.9 mg%, respectively). The decrease was in keeping with the severity. The other investigations found that increased clotting time always resulted in decreased fibrinogen.

In this investigation, we sought to determine which of primary fibrinolysis or disseminated intravascular coagulation was the underlying mechanismcausing the coagulation abnormalities.

DIC was identified as the main mechanism by a number of worldwide investigations, including the one by Reid and an Indian research by Mohapathra et al. However, Saini et al's investigation on 30 snake bite patients identified fibrinolysis as the main mechanism33. When combined with a normal platelet count, early clot lysis, a considerable increase of FDP, and negative tests for fibrin monomers (as evaluated by the protamine sulphate test), primary fibrinolysis, a Rather uncommon disease, can be detected. However, as these results were not present in our patients, we favour DIC as the main mechanism.

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To summarise the coagulation profile modifications, it is discovered that both intrinsic and extrinsic mechanisms are activated by snake venom equally, with DIC serving as the primary cause of haemorrhage. This suggests that the use of heparin during the initial stages of therapy. Unusual platelets could be a contributing factor, however are not the main culprits. Observed: spontaneous mucosal bleeding maybe as a result of hemorrhagic immediately vasotoxic.

Typical snake bites that cause bleeding diathesis

Only 23% of our patients were able to identify the snakes, of which bites from 72.72% saw-scaled vipers, 18.18% Russell vipers, and 9% kraits were the most common. Other researchers have noted distributions that are comparable.

Since the majority of patients (77%) were unable to identify the snake that bit them, we would want to emphasise, as indicated by Reid, that the therapy should be based more on the clinical presentation than on snake identification.

widespread types of systemic bleeding 33.3% of the patients in this study had systemic haemorrhage. suffered hemoptysis or hematuria, 58.3% had gum bleeding, and the remainder haemetemesis. Hemoptysis and other frequent kinds are mentioned in literature. Hematuria (Virmani et al. from Kashmir) and Reid.

Beginning of the Aberrant Coagulation

Practically speaking, it is very challenging to determine the exact moment. of the development of an aberrant coagulation in a specific patient. As mentioned the PT and APTT may be prolonged even before they have finished extension of the clotting period.

In order to determine the shortest (2 hours) and longest (12 hours) times between the bite and the onset of coagulation abnormality, we used patients who experienced clotting abnormalities after admission.

Data from patients who had bleeding diathesis at admission were used to compute the average interval, which came to 7.15 hours.

Quantitative Evaluations Based On Clinical Severity

The fibrinogen level and clinical severity were somewhat correlated, with the fibrinogen level being 166 mg% in Grade II patients and 143 mg% in Grade III patients. Like in prior research, none of the other tests—including FDP estimationand platelet count—showed any link.

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THE AMOUNT OF TIME NEEDED FOR CLOTTING TIME TO NORMALISE

Reid said that after using a particular antiserum for 9 hours and a polyvalent serum for 24 hours, the clotting time reverted to normal. The average duration for normalisation in our investigation was found to be 7.9 hours in Grade II envenomation and 18 hours in Grade III envenomation using fixed sufficient dosages of polyvalent serum alone. Similar to the results of the Orissan trial, it took 48 hours for TT, APTT, and PT to recover to normal. It took roughly 3 to 4 days for FDP fibrinogen and platelet counts to return to normal.

RELATIONSHIP BETWEEN THE BEGINNING OF TREATMENT, THE EMERGENCE OF PROBLEMS, AND THE NORMALISATION OF THE CLOTTINGTIME.

Reid was the first to demonstrate that medication caused the coagulation profile to quickly revert to normal, regardless of how long had passed before starting treatment. The findings of our study indicate that the degree of the bite and the amount of time before treatment began both affected the likelihood of problems and the length of time needed to achieve normal coagulation. Based on this information and in conjunction with a 1968 publication from the Lancet, researchers came to the conclusion that there is no time restriction for beginning ASV therapy and that ASV can be helpful even when administered late.[10]

FAILURE OF THE KIDNEYS AND IRREGULAR COAGULATION ARE RELATED.

According to our study, 19% of cases of renal failure occur. It had a higher frequency in grades II and III. According to grade distribution, the prevalence increased in the tougher grades, from I to III. This suggests that aberrant coagulation directly contributes to the aetiology of renal failure. After obtaining therapy elsewhere, 3 cases with established renal failure were admitted. Renal failure occurred in one patient in Grade I, indicating that the kidneys were directly impacted by the snake venom in this instance. Only low platelet counts and fibrinogen depletion showed a correlation with the onset of renal failure among the quantitative tests.

CONCLUSION

The most frequent type of snake bite poisoning observed in this investigation was hemotoxic envenomation. Most bites primarily affected the lower limbs. Krait was the most toxic snake (in terms of fatality), whereas Saw-Scaled Viper was the most prevalent snake causing coagulation abnormalities. The most frequent type of systemic bleed seen was gum bleeding. Local symptoms and a prolonged clotting time demonstrated a 100% sensitivity for diagnosing hemotoxic envenomation. The main cause for the coagulation abnormalities appears to be diffused intravascular coagulation. Since bleeding times were consistently typical and platelet counts were only moderately reduced in the majority of instances, mucosal bleeding was most likely caused by hemorrhagin's direct vasotoxic action. All cases of prothrombin and activated partial thromboplastin time

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lengthening indicate that snake venom affects both intrinsic and extrinsic pathways of coagulation. Fibrinolysis is a significant factor in the aberrant coagulation in snake bites, as shown by the decreased fibrinogen and the presence of fibrin breakdown products. The onset of coagulation irregularity followed a snake bite anywhere between two hours and twelve hours afterwards. In this investigation, it was discovered that the amount of time between the bite and the start of treatment was connected to the amount of time needed for the coagulation abnormalities to normalise or the emergence of problems. After ASV therapy, it was discovered that Grade II and Grade III patients needed about 8 hours and 18 hours, respectively, to return to normal clotting times. It was discovered that disseminated intravascular coagulation and the direct effect of venom on the kidney both contributed to the development of renal failure.

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