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Original Research Article

Evaluation of Diagnostic 20 Min Whole Blood Coagulation Test (WBCT20) to Detect Coagulopathy in Vasculotoxic Snake Bites

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Abstract

Background: Snake bite is a major public health problem in India with estimated annual snake bite incidence is about 66-163/1 lakhs population, morbidity about 1.4 to 68 / 1 lakhs population, mortality about 1.1 to 2.4 / 1 lakhs population and case fatality rate of 1.7 to 20%1. The Indian study estimates from a national mortality survey in 2001-03 found that 562 deaths (0.47% of total deaths) were assigned to snakebites. Snakebite deaths occurred mostly in rural areas (97%), and more commonly among males than females and peaking at ages 15–29. Snakebites also occurred more often during the rainy and monsoon season. This proportion represents about 40,900-50,900 annual snakebite deaths nationally or an annual age-standardized rate of 4.1/100,000, with higher rates in rural areas (5.4/100,000), and with the highest rate in the state of Andhra Pradesh (6.2/100,000).

Objectives: To determine the sensitivity and specificity of the 2ml 20 min whole blood clotting test in clinical practice under the usual conditions of its use for detection of coagulopathy in vasculotoxic snake/ viper bites.

Methodology: In this study adult patients with suspected vasculotoxic snake bites envenoming were recruited. Age, sex, bite information, clinical effects, serial WBCT20, laboratory investigations and antivenom treatment were recorded. The results of 2ml 20min WBCT was compared with the special Blood Coagulation Profile Test to assess the validity of WBCT20 in early detection of coagulopathy for consideration of ASV in vasculotoxic snake envenoming and reaching end-point of ASV treatment in VICC. WBCT20 was done by using 2ml of whole blood in a 10ml borosilicate glass tube with a dimension of 13mm×100mm. The Prothrombin Time (PT) and INR tests are cost effective, reliable and reproducible.

Results: The incidence of snake bites was more common in males (82.3%) with a male to female ratio of 4.6:1. The majority of cases belong to 31 to 40 years with mean age of 39±14.81. . The timing of snake bite most commonly observed was between 6 AM to 6 PM (52.94%) which is working hour for the population. Major site of bite was lower limbs in 75.49% and most of the cases belong to rural areas. Majority of cases i.e. 32.35% presented late to the hospital after 12hours of snake bite. The WBCT20 was positive in 45/67 patients with VICC [sensitivity 67.16% (95% confidence interval (CI): 54.60–78.15%) in relation to INR] and was falsely positive in 3/102 cases without coagulopathy.

Conclusion: WBCT20 is an insensitive test to detect coagulation disorder as an indicator of systemic envenomation in the victims of vasculotoxic snake bites though it is simple, rapid, cheap and specific. The WBCT20 can guide therapy after potential snake envenomation in resource poor areas where laboratory testing is unavailable. Along with the WBCT20, a standard coagulation test like PT/INR plus clinical findings can be used to guide the therapy.

Keywords: Coagulopathy, Vasculotoxic, Snake bites, WBCT20.

Introduction

Snake bite is a major public health problem in India with estimated annual snake bite incidence is about 66-163/1 lakhs population, morbidity about 1.4 to 68 / 1 lakhs population, mortality about 1.1 to 2.4 / 1 lakhs population and case fatality rate of 1.7 to 20% [1]. The Indian study estimates from a national mortality survey in 2001-03 found that 562 deaths (0.47% of total deaths) were assigned to snakebites. Snakebite deaths occurred mostly in rural areas (97%), and more commonly among males than

females and peaking at ages 15–29. Snakebites also occurred more often during the rainy and monsoon season. This proportion represents about 40,900-50,900 annual snakebite deaths nationally or an annual age-standardized rate of 4.1/100,000, with higher rates in rural areas (5.4/100,000), and with the highest rate in the state of Andhra Pradesh (6.2/100,000). However death rate in Odisha was 5.6 per 100,000. Annual snakebite deaths were greatest in the states of Uttar Pradesh (8,700), Andhra Pradesh (5,200), and Bihar (4,500) [2]. Therefore, there is an urgent need to prevent death due to snakebite in India. Venomous snake can be vasculotoxic, neurotoxic or myotoxic. Viper venom is vasculotoxic, Krait and Cobra venom is neurotoxic, Seasnake venom is myotoxic and Russell's viper venom has mixed vasculotoxic & neurotoxic features in certain geographical area. The usual complications of vasculotoxic snake bites are local cellulitis, haemorrhagic manifestations, DIC, acute renal failure, intravascular haemolysis, pulmonary oedema, shock, acute pituitary/adrenal insufficiency, cardiac arrhythmia and death. [1] The cytolytic or necrotic toxins are the digestive hydrolases destroy cell membrane and tissue, increase permeability resulting in local swelling [1]. The major treatment in vasculotoxic snake bite is anti-snake venom administration that aims to neutralize the toxins in the venom. However, anti-snake venom is expensive, difficult to obtain in some parts of the world and associated with a significant risk of systemic hypersensitivity reactions. It is therefore essential to determine which patients have envenoming rapidly and accurately and will require anti-snake venom, and which are non-envenomed, or have been bitten by non-venomous snakes. The 20-min whole blood clotting test (WBCT20) has been used for decades in viper (and other snake) bites to determine if patients have a clinically significant coagulopathy. The WBCT20 was not intended as a clotting test but as an indicator of envenoming (and need for anti-snake venom) in patients bitten by snakes that cause coagulopathy [3]. The first evidence of systemic envenoming might appear at anytime from the time of bite and therefore, the patients should be monitored continuously to detect it. In the case of suspected Russell's viper bite where there are no physical signs of envenoming such as bleeding tendency, decreased urine output, local pain or moderate to severe local swelling, WBCT20 is a very important marker of first evidence of envenoming. In such a situation while anticipating a positive result one must repeat WBCT20 on an hourly basis till it becomes positive during first six hours from the time of bite. Positive WBCT20 is an indication to administer the first dose of AVS therapy. Thereafter, successive WBCT20s are performed at 6hour after the every doses of ASV. If it remains positive 6 hour after 1st dose, 2nd and 3rd doses of ASV (10 vials) should be administered to achieve normal coagulation. Ninety eight percentages (98%) of Russell's viper bites produce definitive envenoming [4]. Despite the widespread reliance on this test and it being regarded as the standard of care for treatment of snake envenoming in resource poor settings, there have been no studies that have determined the conditions under which the test can be performed accurately, validated it against standard tests or demonstrated that it is accurate in the field[3]. The study widely cited as demonstrating the reliability of the WBCT20 compared it with PT/INR, aPTT, fibrinogen concentrations and TPC [5]. These are the usual tests used and are more representative of global clotting function.

Objectives: To determine the sensitivity and specificity of the 2ml 20 min whole blood clotting test (WBCT20) in clinical practice under the usual conditions of its use for detection of coagulopathy in vasculotoxic snake/ viper bites.

Material and Methods

This prospective observational study was done among 102 suspected case of vasculotoxic snake bite individuals from the duration of January 2016 to January 2017 and are inducted from in-patient department of Medicine S.C.B. Medical college Hospital, Cuttack.

The patient will be diagnosed as a case of vasculotoxic snake bite by presenting features such as:

a. Local fang marks, pain, cellulitis, bruising, necrosis, abdominal pain.
b. Hypotension and shock
c. Bleeding manifestations such as hematemesis, malena, hematuria, epistaxis, continuous oozing of blood from bite site etc.
d. Decreased urine output and dark brown urine following bite
e. Description of snake by the victim if possible.

For each patient enrolled in study, patient data with regard to clinical presentation 2ml 20min Whole Blood Coagulation Test and investigation will be recorded at same time. These patients should be followed up with routine investigations like Complete blood count, Comment on peripheral smear, Urine routine examination, Renal Function Test (serum urea, serum creatinine, serum sodium and serum potassium), Blood glucose level and Liver Function Test. Special investigations needed are plasma fibrinogen, fibrin degradation product, PT, aPTT and INR.

Inclusion Criteria: Patients with history of snake bite with signs of envenoming who had not received ASV were included in the study after obtaining ethical committee clearance as well as informed consent from all patients. Patients with history of unknown bite with signs of vasculotoxic snake envenoming is also included in the study.

Exclusion Criteria: Patient of non-poisonous snake bite, neurotoxic snake bite and scorpion bite. Exclude those who are on hormonal contraceptives or hormonal therapy for any disease, anticoagulant / anti platelet therapy. Exclude those with chronic medical conditions like chronic liver disease, chronic kidney disease, coronary artery disease, coagulopathy, leukemia, connective tissue diseases were excluded in the study.

Methodology:

All vasculotoxic snake bite patients after fulfilling all inclusion and exclusion criteria will be recruited for the study after taking informed consent, detailed history and physical examination through preset proforma. For each patient, before giving anti-snake venom 2ml venous blood will be drawn for bed side 20min Whole Blood Coagulation Test (WBCT20) and simultaneously other samples of blood will be send for routine blood test and special blood coagulation profile test to the clinical haematology laboratory S.C.B MCH. These tests will be repeated again at 6hours after the 1st dose of ASV and 6hrs after the 2nd dose of ASV. The result of 2ml 20 min WBC Test will be compared to the special Blood Coagulation Profile Test to assess the validity of 2ml WBC Test in early detection of coagulopathy in vasculotoxic snake envenoming and reaching end-point of ASV treatment in VICC.

Statistical Evaluation: In this study sensitivity, specificity, positive predictive value (PPV) and Negative predictive Value (NPV), 95% Confidence Interval (95% CI) analysis of 20min Whole Blood Clotting Test (WBCT20) was performed. Sensitivity was defined as the proportion of envenomed cases with VICC where the WBCT20 was positive. Specificity was defined as the proportion of non-envenomed patients with negative WBCT20. Positive Predictive Value (PPV) is the probability that the patients with a positive WBCT20 Test truly envenomed and having VICC. Negative Predictive Value (NPV) is the probability that the patients with a negative WBCT20 Test truly non-envenomed.

Ethics approval and consent to participate- The institutional ethics committee (Approval No-IEC/IRB No: 454/18.2.17) authorized the study, and each patient provided informed permission

Observation and Results:

Table 1: Age and gender wise distribution of cases

Age in Years	Male Cases	Female Cases	Total
15 - 20	8 (7.84%)	2(1.96%)	10(9.8%)
21 -30	16 (15.6%0	2(1.96%)	18(17.6%)
31- 40	28(27.4%)	5(4.9%)	33(32.3%)
41-50	18(17.6%)	4(3.9%)	22(21.5%)
51-60	7(6.8%)	3(2.9%)	10(9.8%)
>60	7(6.8%)	2(1.9%)	9(8.8%)
TOTAL	84(82.3%)	18 (17.6%)	102(100%)
Mean Age	38.08	39.77	39
Standard Deviation	13.11	15.44	14.81

In this study majority of cases were in the age group of 31 to 40 years with mean age of 39±14.81. Out of this 82.3% were male with mean age of 38.08±13.11 and 17.6% were female with mean age of 39.77±15.44. Male cases are more common than females.

Table 2: Site of Snake Bite (n = 102)

Site of Snake Bite	No. of Patients	Percentage
Right upper limb	16	15.6%
Left upper limb	7	6.8%
Right lower limb	37	36.2%
Left lower limb	40	39.2%
Trunk	2	1.9%
Total	102	100%

40 cases (39.2%) of snake bite site was on left lower limb, 37 cases (36.2%) right lower limb, 7 cases (6.8%) left upper limb and 16 cases (15.6%) right upper limb. In this study maximum (50%) numbers of snake bite were observed in cultivation field. Majority of snake bite were occurred during 6PM-12AM about 33.3%.

Table 3: Time Lag between Snake Bite and Hospitalisation (n = 102)

Time Lag	No. of patients (N=102)	Percentage (%)
0 - ≤1hrs	22	21.5%
>1 - ≤6hrs	24	23.5%
>6 - ≤12hrs	23	22.5%
>12 -≤24hrs	21	20.5%
> 24 hrs	12	11.7%

12 cases (11.7%) presented late to the hospital after 24 hours, 21 cases (20.5%) presented within 12-24 hours, 23 cases (22.5%) within 6-12 hrs, 24 cases (23.5%) within 1-6 hrs and 22 cases (21.5%) are within one hour.

Table 4: Different Clinical Features of Patients at the time of admission (n=102)

Symptomatology	No. of patients	Percentage
Local swelling /cellulitis	102	100%
Fang mark	43	42.15%
Oliguria	13	12.74%
Haematuria	6	5.88%
Bleeding manifestations	17	16.66%
Gangrene	7	6.86%
Pain Abdomen	2	1.96%
Fever	5	4.9%

Among all patients 102 cases (100%) presented with local swelling, 13 cases (12.74%) had oliguria, 6 cases (5.88%) had hematuria, 43 cases (42.15%) had fang mark at the site of bite, 7 cases (6.86%) had gangrene, 2 cases (1.96%) had pain abdomen, 17 cases (16.66%) with bleeding manifestations and 5cases (4.9%) had fever.

Table 5: Association between Times required for Hospitalisation & Raised PT.

Bite to needle time	Number of cases		Total
	PT raised	PT not raised	
≤ 1hr	10(45.4%)	12(54.5%)	22(100%)
1- 6hrs	19(79.1%)	5(20.8%)	24(100%)
> 6hrs	49(87.5%)	7(12.5%)	56(100%)
Total	78(76.4%)	24(23.5%)	102(100%)

X2 value (Chi-squared Value) =19.226, df=2, p-value <0.01.

Table 6: Results of WBCT20 during admission (T0) and 6hrs after 1st dose ASV (T6) in cases studied (n=102)

WBCT20	During admission(T0)	6hrs after 1st dose ASV(T6)
	Numbers (%)	Numbers (%)
Positive (Not clotted)	48(47.05%)	20(19.60%)
Negative (Clotted)	54(52.9%)	82(80.39%)
Total	102(100%)	102(100%)

In our study 48 cases (47.05%) had incoagulable blood i.e. WBCT20 Positive at the time of admission in all suspected vasculotoxic snake bite but six hours after receiving 1st dose of ASV the numbers of incoagulable plasma decreases to 20 cases.

Table 7: Determination of sensitivity and specificity of WBCT20 during admission i.e. T0 (by considering PT as standard)

WBCT20	PT >16 Sec	PT≤16 Sec	Total	
Positive	47	1	48	
Negative	31	23	54	
Total	78	24	102	
Diagnostic Utility of WBCT20		95% Confidence Interval (95% CI)	+ve Likelihood ratio (+ve LR)	-ve Likelihood ratio (-ve LR)
Sensitivity	60.25%	48.54% -71.17%	14.46	0.41
Specificity	95.83%	78.88% - 99.89%		
Positive Predictive Value	97.91%	87.25% - 99.69%		
Negative Predictive Value	42.59%	35.80% - 49.68%		

Table 8: Determination of sensitivity and specificity of WBCT20 Six hours after receiving first dose of ASV i.e. T6 (by considering PT as standard)

WBCT20	PT >16 Sec	PT≤16 Sec	Total	
Positive	18	2	20	
Negative	38	44	82	
Total	56	46	102	
Diagnostic Utility of WBCT20		95% Confidence Interval (95% CI)	+ve Likelihood ratio (+ve LR)	-ve Likelihood ratio (-ve LR)
Sensitivity	32.14%	20.29% - 45.96%	7.39	0.71
Specificity	95.65%	85.16% - 99.47%		
Positive Predictive Value	90%	68.77% - 97.35%		
Negative Predictive Value	53.65%	48.90% - 58.35%		

Table 9: Evaluation of WBCT20 Test by considering different coagulation parameters

Evaluation of WBCT20 Test		Different coagulation parameter				
		PT	INR	aPTT	Pl.Fibrinogen	TPC
Sensitivity & (95% CI)	T0	60.25% & (48.5-71.17%)	67.16% & (54.60–78.15%)	66.19% & (53.99 - 77%)	72.13% & (59.17-82.85%)	58.06% & (39.08–75.45%)
	T6	32.14% & (20.29-45.96%)	32% & (19.52–46.70%)	33.33% & (20 – 48.95%)	48.57% & (31.38-66.01%)	16.66% & (4.74 – 37.38%)
Specificity & (95% CI)	T0	95.83% & (78.88–99.89%)	91.4% & (76.94–98.20%)	96.7% & (83.30–99.92%)	90.24% & (76.87-97.28%)	57.74% & (45.44–69.39%)
	T6	95.65% & (85.16–99.47%)	92.3% & (81.46–97.86%)	91.22% & (80.7 – 97.09%)	95.52% & (87.47-99.07%)	79.48% & (68.84–87.80%)
Positive Predictive Value(PPV) & (95% CI)	T0	97.91% & (87.25–99.69%)	93.75% & (83.38–97.82%)	97.91% & (87.16–99.69%)	91.66% & (81.06-96.58%)	37.5% & (28.6 – 47.34%)
	T6	90% & (68.77–97.35%)	80% & (58.95–91.77%)	75% & (54.12–88.41%)	85% & (64.04-94.74%)	20% & (8.46 – 40.35%)
Negative Predictive Value(NPV) & (95% CI)	T0	42.59% & (35.80–49.68%)	59.25% & (50.44–67.52%)	55.55% & (47.29–63.53%)	68.51% & (58.94-76.74%)	75.92% & (66.58–83.32%)
	T6	53.65% & (48.90–58.35%)	58.53% & (53.47–63.43%)	63.41% & (58.13–68.39%)	78.04% & (71.96-83.13%)	75.60% & (71.50–79.30%)

This table shows that sensitivity of WBCT20 test during admission and after receiving 1st dose of ASV were maximum i.e. (72.13%&48.57%) when evaluated against level of plasma fibrinogen. The specificity of WBCT20 is very high when evaluated with all the standard coagulation test except Total platelet count (TPC).

Discussion

Patients with vasculotoxic snake bite were found in all age groups. Maximum number of patients (32.3%) were found in the age group of 31 to 40 years, both in males and females (Table 1).This indicates that snake bite affects people mostly in the working age group. The number of cases in the very elderly age group (>60 years) were less since people in these age group are less involved in outdoor activities(Table1).According to the results of studies reported by Sawai et al (1975)[6],71% of cases were found in the age group of 11 to 50 years. In this study also 81.37% of cases were in the same age group. Our observation is also corroborated with the study by Banerjee R N (1976)[7] where 80% of the cases were in the same age group. In this study majority of cases were in the age group of 31 to 40 years with mean age of 39±14.81 (Table: 1). The incidence of snake bite was more common in males (82.3%) with a male to female ratio of 4.6:1.This could be due to the fact that male persons are engaged more in outdoor activities(Table 1).This observation is supported by a gender distribution between males and females in the ratio of 3:1(Banerjee and Siddiqui 1976) [7] and the study conducted by Yogesh C et al [2014] [8] where males were predominant as compared to females, with male to female ratio of 1.8:1. Safdarjung hospital study shows an incidence of about 75% being males, while Sawai et al (1975) [9] reported the male incidence to be 66.1%. In our study rural patients were 86.27% and urban patients were 13.72%. Similar observations were made in the study conducted by Lal P et al. [2001] [10] where 85% patients were from rural area. The most common site of bite was in the lower limb(75.49%) (Table 3).Warrell DA et al 1976 [11] reported that the majority of bite in their study group were inflicted in the lower extremity (96%). Sawai et al(1975)[9] and Virmani SK et al [12] 1987 also reported lower extremity as the most frequent site of bite in their study with an incidence of 67.8% and 80.6%. Majority of bites occurred when the subjects were working in cultivation field i.e. 50% and total bites during outdoors activities were 81.37 %.This matches with the observation of the study done by Banerjee RN[7] where nearly 75% of bites were in the outdoor. Regarding the timing of bite, Most of the snake bite cases occurred between 6 PM to 12 AM i.e. 33.3% during night, but majorities of bites occurred during day times (6AM to 6PM) i.e. 52.94% which signifies the working hours. Taking the data of snake bite round the year, it has been observed that maximum number of bite (69.60%) occur in Rainy season i.e. June to September. In Rainy season due to rain the holes, crevices and ditches are filled with rain water and snakes leaves

their natural habitat and wander outside and accidentally attack the human beings. There is significant delay of more than 12 hours for hospitalization and receiving anti snake venom in 32.35% patients. Similar findings were reported in study by Chugh et al. (1975). [13] Bleeding manifestation is an important factor contributing to increased mortality. In the present study, 78(76.47%) of the patients showed deranged PT, which was similar to the Mahmood et al [14] (70.00%). Association between bite to needle time and number of patients with raised PT studied, it was found that statistically significant correlation was present between delay in bite to needle time and number of patients with raised PT. Sam et al [15], also reported that there is significant correlation between delay in bite to needle time and presence of coagulopathy. Similarly, Chaudhari et al 2014 [16], Saravu et al 2012 [17] and Mathivani et al 2013 [18] studied various parameters of snake bite separately in different regions, finally all concluding that bite to needle time had significant correlation with complications developed in snake bite patients. Incidence of complications is directly proportional to the duration for which venom was present in the blood, prior to its neutralization by ASV. Increase in complications can be explained by the late arrival of patients to hospital. So the snake venom responsible for all these complications must be neutralised early by anti snake venom (ASV). In the present study, 67 (65.68%) of the patients showed deranged INR, which was similar to the Manisha V Biradar et al [19] study i.e. 66 (58.92%). In our study, deranged APTT was seen in the 71(69.60%) patients. Mahmood etal 2010[14] had similar results with 71.30% of patients having deranged APTT. In present study, these coagulation abnormalities were found in the vasculotoxic snake bites (that were diagnosed clinically), but not in non-poisonous snake bites. But not all the patients with vasculotoxic bites, showed the deranged coagulation profile tests. Anti snake venom is the main stay of therapy in snake bite envenomation. However it has serious toxicity and anaphylactoid reaction during administration, which may leads to death of the patient. ASV is very costly and there is worldwide shortage. Considering this WHO has recommended that ASV to be administered in presence of systemic envenomation like presence of coagulation disorder in vasculotoxic snake bite. The basic tests that determine the coagulation disorder are PT/INR, aPTT, Plasma Fibrinogen, Total Platelet Counts. All these tests are costly, time consuming and not available in rural areas. Hence it is not suitable in most of the places to detect coagulation disorder early. In 1977, Warrell et al. [11] had devised a 20 min whole blood clotting test (WBCT20) using simple test tube to detect early coagulation disorder which was well correlated with the basic standard sophisticated test like PT/INR, aPTT, Plasma Fibrinogen etc. Basing on this, WHO has recommended the simple bedside WBCT20 as gold standard in deciding the indication of ASV administration at admission if it is found to be positive and to repeat ASV for second time after 6hrs depending on the result of WBCT20 test. This test was accepted universally without large study, critically analysis and field trial in various geographical area of the world. The utility of this test has never been critically analysed in India. In our study we use locally available 10 ml borosilicate glass tube and 2ml of whole blood for WBCT20. In the present study we try to correlate the WBCT20 with standard coagulation test like PT/ INR, aPTT , Plasma Fibrinogen and TPC. However considering the facts this Test (WBCT20) has very low sensitivity and specificity in relation to Total Platelet Count. The coagulation disorder in vasculotoxic snake bite is primarily not due to thrombocytopenia. Thrombocytopenia occurs only in few cases in our study as a cause of coagulopathy in vasculotoxic snake bite. It cannot be consider as very good test in coagulation disorder in VICC. The plasma Fibrinogen estimation test and aPTT are very costly test, not available in many areas. The Prothrombin Time (PT) and INR tests are cost effective, reliable and reproducible. The INR has advantage of detecting early coagulation disorder in comparison to WBCT20. The present study has observed that the WBCT20 is less sensitive in detecting systemic coagulation disorder at the initial examination of patient for considering ASV & at 6hr for assessing the requirement of further ASV. Sensitivity of the test was 67.16% (in the present study) during admission , so there will be more false negative cases, which delays ASV administration in 32.84% of the patients those needing antivenom. Due to the low sensitivity of test, the purpose of test to determine coagulopathy and in turn ASV administration was not fulfilled. However the specificity is high both at initial examination and reassessment at 6hour. Therefore an abnormal WBCT20 which is a simple bedside test, cheapest, easily available and can be done by everybody will indicate immediate need of ASV, especially in rural areas, where expensive tests like PT/INR, aPTT, Plasma Fibrinogen and TPC are not available and not affordable. Whereas it's negative result doesn't exclude a systemic envenomation. Number of factors affect the results of the test which include quantity of blood samples used (1ml / 2ml / 5ml), use of bottle / syringe / glass test tube for test, use of different sizes of test tubes/ bottles and tests done by trained investigator or not. Therefore PT/INR is a very essential laboratory test besides aPTT, Fibrinogen and TPC for increasing the detection of coagulation disorder in vasculotoxic snake bites at initial examination and re-evaluation. Clinicians should be made aware about the limited sensitivity of the Test (WBCT20) and all the patients with clinical features of envenomation should receive antivenom. The Serial evaluations of standard

laboratory tests have good prognostic value. This study shows that the PT/INR is an effective and simple means of monitoring recovery from snake bite coagulopathy.

Conclusion

In conclusion, the WBCT20 is an insensitive test to detect coagulation disorder as an indicator of systemic envenomation in the victims of vasculotoxic snake bites though it is simple, rapid, cheap and specific. The WBCT20 can guide therapy after potential snake envenomation in resource poor areas where laboratory testing is unavailable. However a negative WBCT20 doesn't exclude coagulopathy by systemic envenomation as it missed about 32.84% cases where antivenom was potentially indicated during initial evaluation. Along with the WBCT20, a standard coagulation test like PT/INR plus clinical findings can be used to guide the therapy. More attention should be given to standardize the conditions, timing, use and interpretation of the current WBCT20.

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