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Case Report

Profile of Snake Bite Poisoning at Remote Rural Maharashtra: Fourteen Years Clinical Study

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Abstract

Background: Snake bite is neglected tropical disease. Snake bite accident is common in farmers, hunters, labors and migrating population. Patient has to travel 15-20 miles to obtain medical aids, moreover doctors are not train regarding management of snake bite. High morbidity and mortality due to venomous envenoming attributed to delay in diagnosis and management. We report rapid diagnosis and early intervention result in reduction in fatality and morbidity.

Methods: This is retrospective study. Victims of snake bite on arrival to out patient department are examined in details by expert or trained physician. Species of snake bitten is confirmed by detail examination of killed specimen if it produced or by clinical syndromes. This is case series and not the trial.

Results: January 2002 to 31st august 2015, 1625 (87.45%) were bitten by venomous species of snake of these 388 (23.87%) , 343 (21.10%) , 507(32.20%) , 257 (15.81%) 33 (2.03%) and 97 (5.96%) were bitten by cobra , krait , *Russell's viper* , *echis carinatus, pit viper* and haematotoxic without identified the species respectively. Of these 67(4.12%) (*Cobra* 8, *krait* 41 *Russell's viper* 17 and *echis carinatus* 1) died.

Conclusion: Rapid transport of snake bite victim to health center. Early diagnosis by trained physician and rapid interventions reduced the mortality and morbidity due to venomous snake bite poisoning.

INTRODUCTION

Snake bite is an acute life threatening time limiting medical emergency. It is a major public health issue in India. It is preventable public health hazard in tropical and sub tropical countries. It is an occupational hazards often faced by rural population in tropical and subtropical countries with heavy rainfall and humid climate [1,2]. Snake bite is one of the most neglected diseases of poverty [3-7]. Maximum cases occurred when farmers, villagers are busy in farming. Because of high incidence of snake bite cases in rural Maharashtra, physicians working at government hospitals and private well experienced regarding management of snake bite. Yearly snake bite death in India is 45900. Thus one snake bite death for every two HIV/AIDS death. 97 % deaths reported from villagers of these 23% died during treatment [8,9]. Common venous snakes found in Maharashtra state are of big four: Elapidae (*Naja naja or cobra* (Figure 1A) *Krait* or *Bungarus caeruleus* (Figure 1C), Viper (*Russell's viper* (Figure 1B), *Echis carinatus* or saw scaled viper and pit viper (Figure 1D) [10]. Though snake bite a life threatening disease of century old , WHO added it is in the list of neglected tropical diseases march 2009 [11]. Mud houses with multiple grooves in wall, with loose basement stones easy shelter for snakes and rats. Spread of loose grain from leakage of grains stored bags attracts rats. During night hours Snakes find their way to hunt the rats. Villagers always sleep on floor bed of their wattle and daub houses. Cobra took shelter lose stones, firewood close to dwellings and rubbles at high steps attic. Krait active during night hours, accidentally it bites a person sleeping on floor bed. Maximum viper bites patients report during the day or early darkness, while watering the plantation or walking bare foot in grown grass or Soyabean crops. Clinical effects of envenoming by same species of snake are almost similar except a few regional variations [12]. In India, there is always a crisis of antivenom supply [13]. Medical officer who never treated snake bite case before poured excessive antivenom in non -indicted case result in crisis of antivenom supply.

Present study is from rural and remote part of Maharashtra. Here we report a 1625 venomous snake bite cases which on arrival examined by senior experienced physicians regarding diagnosis and management of snake bite [14].

PATIENTS AND METHODS

This is retrospective study and not the trial or new intervention hence no ethical approval is required hence exemption from approval.

Figure 1 A: Cobra B: Krait C: Russell's viper D: Echis Carinatus.

This is retrospective clinical study of venomous snake bite patients admitted at general hospital at Mahad district Raigad and Mukhed district Nanded Maharashtra, India.

On arrival of patient with history snake bite at out patient department detail history of bite , site of bite , activity at the time of bite , time of bite any treatment received or referral letter is done by senior physicians (HSB and DPP). Details are noted in standard Performa (see appendix). If the killed specimen is brought is studied in detail species of snake. Remaining patient who failed to bring the specimen, venomous snake bite and its species confirmed by clinical syndrome approach as follows (Figure 1A, 1B, 1C, 1D)

Cobra bite Figure 1A

Common occurred day time or early darkness. While handling firewood, dry cow dung or blindly handling the rubbles at attic, while playing around loose stones, handling paddy or Jawar husk , or while rescuing cobra from dwelling. Handling long standing un-used school bags at the time of opening school. Victim often saw the hooding cobra.

Local site of bite and clinical effect

Characterized fangs marks, active bleeding or clotted blood on abrasions caused by fangs, ecchymosed at and around bite, rapid swelling at bite site accompanied with severe pain. Followed by giddiness, anxiety due to threat of death, tachycardia, sweating, and loss of consciousness, bilateral ptosis, neurparalysis or sudden death due to cardiac arrest or respiratory arrest. Even victim dies within 15-30 minutes due to cardiac arrest or sudden development of respiratory paralysis. Pupils are dilated and poorly reacting. .

Krait Figure 1C and 3A and 3B

Krait is nocturnal, it enters house in search of prey during night hours between 11pm to mid night. During this time all members are in sound sleep and no movements, quite and silence environment identified by snake as an absence vibrations. Snakes are having no ear but highly sensitive for vibrations. Krait became active and enters in bedding and bite to a person sleeping on floor bed. Krait bite is common in monsoon months. A krait fang is smaller in size like that of insulin needle. It injects venom which is ten times more potent than cobra, in skin or subcutaneous deep. At the same time Victim is in sound sleep, responsiveness reflexes are blunted moreover skin is having poor circulation, though the krait venom molecular size smaller, it is transfer slowly though circulation. Patient did not find any pain or swelling at the bite site or at most mild pain, heaviness of part and parasthesias. Hence bite is totally neglected, may be wrongly attributed to ant bite, rat bite or no bite at all. Within 30 minute to one hour complained of acute abdominal colic, vomiting and mild sweating. This is wrongly attributed to indigestions and again goes to sleep. Within 2 to 6 hours patient developed descending paralysis, bilateral ptosis, dysphasia, unable to lift neck from pillow, pooling of saliva and suffocation. Many times krait is found near or in beddings. Some victims may developed hypertension because of inhibition of presynaptic receptor and released of postsynaptic [15].

Russell's viper Figure 1B, 4B

It is common outdoor bite. During watering of plantations, walking bare foot over a grown up grass, sugarcane or soyabean crops. At time snake is trodden and big size snake may encircle the limbs or bitten part. Bite is usually to lower limbs. Soon after bite victim experienced severe local pain, rapid swelling, swelling may reach to abdomen, active bleeding from fangs abrasion, ecchymosed, tense blebs and regional lymphadenitis and hunter canal tenderness. Within 30 minutes to 4 hours acute bleeding from gums, skin and mucus bleed noted, severe pain in abdomen and hypotension. Reduction in urine out put, renal angle tenderness, hematuria, renal failure, extensive swelling of bitten limb may result in compartment syndrome and gangrene. Severe hypotension, hypoglycemia is attributed to acute bleeding in adrenals and pituitary glands. Bilateral ptosis due to Russell' vipers bite which rare in Maharashtra.

Echis Craniates or saw scaled viper Figure 1D

It is small size snake called *jilebi* snake it flourished in rocks with high humid climate. It bites and rapidly run away. Common bites occurred to left hand of farmer or labors, while harvesting grass or handling soybean crops. Left hand go blindly in grass for to hold bunch of grass while right hand with sickle for to cut the grass. Soon after bite snake rapidly runaway, hence it is seen but rarely killed. Soon after bite victim experienced pain and gradual swelling within couple of hours. Swelling spreads slowly with regional lymphadenitis. If untreated, acute gum bleeding, hematuria, ecchymosed noted 4 to 6 hours of bite.

Bamboo pit viper

It is dark green snake, with triangular head. Usually farmer or labors while handling bushes during month of July -August receives the bite. Obvious fangs mark with edema followed by severe local pain with gradually swelling of limbs without regional lymphadenitis.

In viper venom contain serine proteases and other pro-

coagulant enzymes which has action like that of thrombin or activate factor X, prothrombin and other clotting factors. Actions of these enzymes result in clot formation with fibrin deposition, subsequent fibrin dissolved by fibrinolytic action of own plasmin result in severe depletions of clotting factors manifest disseminated intra vascular coagulation(DIC). Russell' viper venom contains toxins that activates factor V, X, IX and XIII, fibrinolysis, protein c, platelet aggregation, anticoagulation and bleeding. Envemonation by viper result in systemic defect of anticoagulation may lead to gingival bleeding, epistaxis, hemoptysis, hematuria, hemetemesis, rectal bleeding or malena. Intraabdominal or intracranial bleeding may result in coma. Retinal bleeding results in visual disturbances. Hypotension accompanied with tachycardia or bradycardia. Delayed shock may be attributed to excessive blood loss or hemolysis. Envenomation may result in pulmonary edema due to destruction of the endothelial lining of pulmonary vessels and pooling of pulmonary blood. Pulmonary hemorrhages with capillary leaking syndrome characterized by conjunctivae edema, irreversible shock and multi organs failure.

20 minute whole blood clotting test (20WBCT)

This test is regarded as reliable test of coagulation which can be carried out by bedsides. It is superior to "Capillary tube" method for establishing consumptive coagulopathy in snake bite poisoning. A few milliliters of fresh venous blood is withdrawn in a fresh, clean and dry glass test tube not washed by any antiseptic or detergent and left undisturbed at room temperature for 20 minutes. After that tube should be gently tilted or tipped of to detect whether blood is still liquid and if so confirmed incoaguable or DIC. Test should be carried out every 30 minutes from admission for 3 hours and then hourly after that. Once victim received ant venom test is invalid if it is perform within six hours of last dose of ASV, as minimum six hours are necessary for liver to replace the clotting factors in circulation [16].

Renal profile

Close monitoring of hourly urine output, 12 hourly investigations for serum electrolytes and blood urea, serum creatinin.

Hemo-dialysis

It is indicated in raised serum creatnin > 9 mg/dl, hyper kalmia and hemodynamic disturbance.

Figure 2 A: Bilateral ptosis with myasthenia look a case cobra bite Bilateral Ptosis **B:** Severe local tissue damage at the site of cobra bite extensive skin necrosis at bite site.

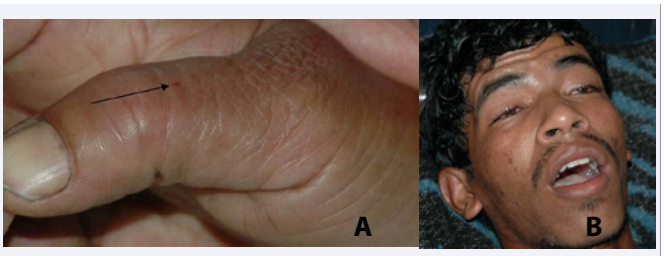

Figure 3 A: Minute pin head abrasion at the site of krait bite. **B:** Bilateral ptosis with bulbar palsy in krait bite victim.

Polyvalent anti-snake venom (ASV) of Haffkine institute Mumbai - 100ML is added in 200Ml saline and given by intravenous route over 60 minutes in cobra , krait and Russell's viper envenoming , 50 ML repeated if active bleeding (viper) and no improvement in neuroparalysis after 30 minutes of initial dose another 50 Ml is repeated. In viper bite 20WBCT done every six hourly if blood remains incoaguabl then 20 Ml ASV is repeated. Physician sat near the patient till dose of ASV is over for to note any anaphylaxis to ASV.

Neuroparlytics

Artificial ventilation and endotrachael intubation done when there is respiratory depression diagnosed by one minute counts, decreased in respiratory rate , poor or failed expansion of chest, abdominal respiration , pulling of saliva, grade 3/5 power in all voluntary muscle, unable to lift the head from pillow or FEV1 <200ml.

Acetyl choline esterase inhibitor (AChE)

It is whether victim will respond to AChE inhibitor or not, can be tested by putting glove finger filed with ice over ptosis eyelid. If there is improvement in ptosis confirmed that the neostigmine administered 25microgram per kg over first one hour and later 50microgram/kg for next four hours continued till muscle powers improves to more than grade3/5 or able to lift the head from pillow. Each dose of neostigmine proceeds by 0.60mg atropine.

RESULTS

Present study is done at two rural centers at rural remote part of Maharashtra. Mahad in Raigad district and Mukhed in Nanded district with high incidence of venomous snake bite [10,15]. This study is mainly on clinical ground with primitive investigations available with restricted resources at rural settings, carried from January 2002 to August 2015 (Table 1-4).

During this 13.5 years total 1858 snake bite cases attended the out patient department, of these 1625 (87.45%) were bitten by venomous snakes with envenoming. 233 (12.55%) had bitten by non-venomous bite without any signs and symptoms of envenoming. These 233 cases were observed for 24 hours and discharged by giving them tetanus toxoide

Total 1626 (male 978(60%) Female 645 (40%)) venomous snake bite admitted. Of these 388(23.87%), 343(21.10%),507(32.20%),257(15.81%),33(2.03% and 97(5.96%) were cobras, krait Russell's viper , Echis carinatus, bamboo pit

Table 1: Sex wise distributions of snake bite cases.

Species	Male	Female
Cobra	205	183
Krait	189	154
Rv	342	165
Ecis	167	90
Vasculotoxic non-identifies	55	42
Pit Viper	20	13
Total	978 (60%)	647 (40%)

Table 2: Age wise distribution of cases.

Age in years	Cobra	krait	RV	Saw scaled viper	Vasculotoxin Non-defeined	Pit Viper
0-20	119	139	107	63	24	3
21-40	154	172	245	110	46	24
41-60	99	26	125	65	25	5
>61	16	6	30	19	2	1
Total (%)	388(23.87)	343(21.11)	507(31.2)	257(15.81)	97(5.96)	33(2.03)

Table 3: Month wise distribution of snake bite cases.

Month	Total	Cobra	Krait	Russell's viper	Echis Carinatus	Vasculotoxic non-identified	Pit viper
January	52	11	3	20	12	6	-
February	63	25	3	19	13	3	-
March	99	39	4	28	23	5	-
April	68	31	6	26	4	1	-
May	101	44	33	19	3	2	-
June	228	46	74	38	35	15	20
July	246	53	62	73	34	19	5
August	242	36	57	79	51	12	7
September	237	43	67	76	35	15	1
October	144	33	18	56	25	12	-
November	92	15	9	46	17	05	-
December	53	12	7	27	05	02	-
Total	1625	388	343	507	257	97	33

Table 4: Clinical manifestation s and out came of snake bite cases.

Clinical	Total	Cobra	krait	Russell's viper	Echis Carinatus	Vasculotoxic	Pit viper
Dry bite	7	5	2	-	-	-	-
Neuro paralysis	501	166	332	3	-	-	-
Respiratory paralysis	498	166	332				
Referred	53	30	23				
Death	67	8	41	17	1		
Local tissue damage with edema	914	42	nil	492	250	97	33
Gangrene		12	Nil				
Hypertension		-	18				
Pul oedema	6	-	6				
Acute bleeding	736	-	-	499	140	97	-
Renal failure	89	-	-	74	10	5	-
Hypotension and shock	97	3	-	90	-	4	-
ASV reaction	310	10	110	130	50	10	-
Killed specimen	274	12	185	38	19	-	20

viper and vasculotoxic not identified snakes bite envenoming respectively.

Cobra bite

Total 388 (Male 205 female 183) (Table1-4) cases were accidentally bitten by cobra. O f these 40% cases are of age group 21-40 years. 350 (90%) reported between February to October months. 166 (42%) had neuron -paralysis with respiratory depression of these 30 (8%) transferred to tertiary care hospital . 42 victims had severe local tissue damage , contractures and disability ,12 (3.09%) had developed gangrene of bitten part . 3 had hypotension necessities intravenous fluids and dopamine drip for 24 hours. 12 brought the killed specimen and 2 victims died on way to Mahad and 6 died during treatment (2.06%).

A 4 year child was bitten by cobra to his ankle at 6Pm on 11th June 2004. Child was brought in acute respiratory paralysis. At out patient department there was no availability small size endotrachaeal tube. We performed tracheal intubation with available small size simple urinary rubber catheter and put on ventilator .He was discharged on 14th July 2004.

Krait bite

343 (M-189 F 154) cases of krait bite studied. 172(50%) are from age group 21 -40 years. 341 cases had history of bite at night hours to a person slept on floor bed. 2 victims had dry bite. 280 (82%) cases occurred during monsoon season in months of June to September. 74(25.5%) occurred in June month. 332 victims developed neuroparalysis and respiratory depression necessitated ventilator support. 3 victims referred to tertiary care hospital who required ventilator support for one week. 41 died (11.95%) of these 7 cases brought dead and 34(10%) died during treatment. 18 victims had raised blood pressure from 130/90 to 210/140. Of these six patients had massive pulmonary edema recovered with intravenous nitroglycerine drip (Table 1-4).

Russell's viper bite

Figure 4A, indicates compartment syndrome and figure 4B active bleeding from mouth cavity. waters had left cerebral infarction due russell' s viper bite due to 8 hours delay for administration of antivenom . 507(31.2%) victims bitten by Russell's viper. All victims reported during day time. These cases are reported almost all months of year. However 330(65%) cases occurred in the months July to November, when the farmers are busy in farming. 245(48.32%) victims are of age group 21-40 years. 3 patients had persistent ptosis for 72 hours with no respiratory depression. Local edema with fangs marks, acute bleeding from abrasions. One had cerebral infarction with persistent aphasia (Figure 4A,B). Progressive edema with local tissue damage noted in 499(99%) cases. 90 had hypotension with shock, 74 had acute renal failure of these 12 cases had conjunctiva chemosis, generalized edema with alveolar bleedings suggestive of capillary leaking syndrome. 17 (3.35%) victims died. Of these one died of massive cerebral bleeding a known case of hypertension. 19 developed non –healing ulcers, contractures and deformity.

Echis carinattus or Saw scaled viper

Figure 4 Acute gum bleeding due to Russell's viper bite.

257 (M167 F90) cases had bitten by saw scaled viper. 110 (42.80%) cases are from age group 21-40. There are two peaks of high incidence of envenoming. June to October total cases 180(70%) and February to April and January to march 48(18.67%).Local tissue damage at the site bite with edema noted in 250 (97.27%) patients. Acute gum bleeding occurred in 140 (54.47%) patients. Haematuria with renal failure in 10 (3.89%).

Bamboo pit viper (Trimeresurus)

33(m20 F 13) (Table 1-4) patients were bitten by bamboo pit viper all cases occurred in the months June to September. 24(72.72%) seen in the age group 21-40. All victims had severe local pain with fangs marks at the site of bite and progressive edema of the bitten part without regional lymphadenopathy. Specific antivenom against Trimeresurus species not available in India. However paraspecificity of venoms of snake species is well known. Hence polyvalent antivenom was administered to these victims.

Vasculotoxic non –identified the species

97 patients bitten by unknown snakes. Victims and relative just noted a rapid passing snake or movements without noting exact character such as size or color. Clinical manifestations consisted of fangs marks with progressive edema. 20WBCT was positive. 77 responded to ASV while 5 had acute renal failure and 15 referred to tertiary care hospital.

SPECIAL SITUATIONS

In this study 7 months, 5, 5 years ,16 months and 4 years of age youngest victims of *cobra, krait, Russell's viper , Echis carinatus* and vasculotoxic not identifies snake bite respectively .

Three pregnant women of 3, 6, 4 months gestations were bitten by krait, cobra and Russell's viper respectively. Both cobra and krait bite victims had respiratory paralysis recovered with ASV and ventilator. While Russell' viper bite had acute bleeding. All delivered a normal full term fetuses.

Recurrent bite

On 3may 1996 a 35 years farmer while collecting *Jawar* husk had cobra bite had respiratory failure. He recovered with ASV, ventilator and neostigmine atropine. On 2nd August 1997 he was bitten by Russell's viper while harvesting grass for cattle. He

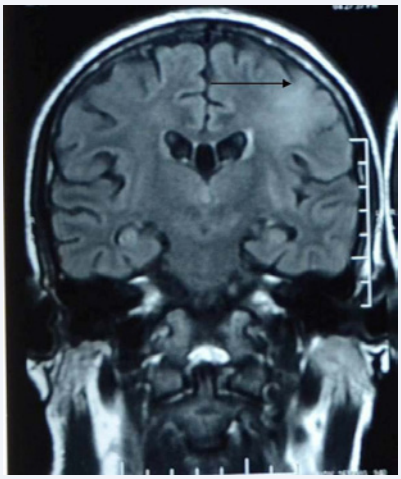

Figure 5 Water shade appearance of cerebral infarction in Russell's viper bite.

had local edema with fangs marks and 20WBCT was positive he recovered with 18 vial of ASV. On 15th June 2000 while harvesting the grass he was bitten by *Echis carintus* to his left little finger. He had signs of envenoming was recovered with 60 ML of ASV.

Double trouble

(Figure 6 Aand 6B) A 50 years old lady was bitten by non venomous snake to her left foot while she was in bathroom. She afraid of death and became more anxious. She reported within one hour to hospital. Killed specimen was non –venomous wolf snake. She develops marked tachycardia, blood pressure 60 mmhg and had severe chest pain and discomfort with profuse sweating. Her electrocardiogram showed acute inferior was infarction. She was resuscitated with intravenous fluid and thrombolysed and discharged on 5th day.

Uncommon site of bite

A 30 years male while entering in wattle and daub house was bitten by cobra to his vertex. A 70 years male sleeping on open ground was bitten by Russell' viper to occipital area. 18 years boy while defecating in open toilet at early darkness was bitten by Russell's viper to his penis. A 38 years man during summer month sleeping open ground was bitten by krait to his scrotum.

A 30 years male was bitten by cobra to his left index finger. Because of threat of death he himself imputed the bitten finger (Figure 7). Still he had signs and symptoms of neuroparalysis.

On 11th November 2009 over 24 hours we received four patients of age 20 female, 60 years male,35 years male and 42 years male of cobra , *Echis,* Russell's viper and Echis carinatus bite respectively. All the four had signs of systemic envenoming recovered with treatment.

Total 274 (14%) (Cobra 12, krait 165, Russell'd viper 38, *echis carinatus* 19 and bamboo pit viper 20) killed specimen of snakes were brought to hospital by patients relatives

Snake bite to snake rescuers

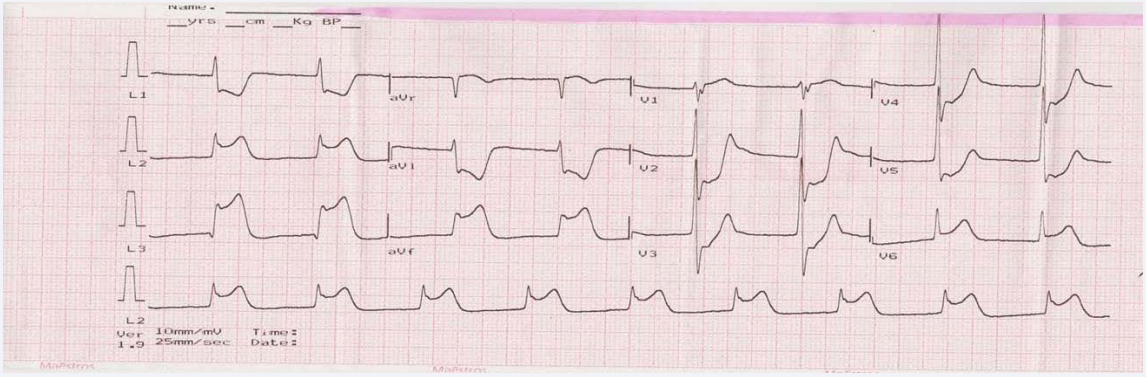

Figure 6a ECG Acute inferior wall infarction with reciprocal changes.

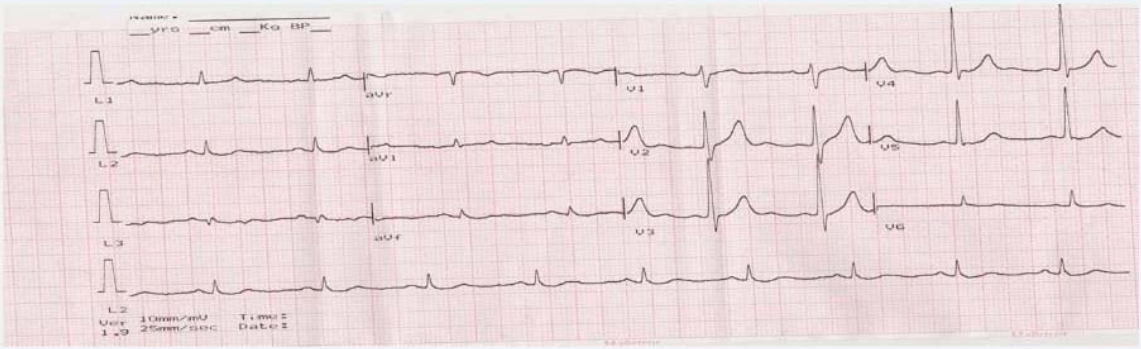

Figure 6b Regression of acute changes after intravenous tinectiplase.

Figure 7 Victim himself amputated the terminal metacarpal a site of cobra bite.

Table 5: Four cases received Russell's viper bite had systemic involvement in form of acute bleeding.

No/age/sex	Species	Site Of bite	Activity	Local	Systemic	Interval Bite To hospital In minutes	ASV	Other	Result
1/30/m	Cobra	Left thumb	While putting in plastic bag	Fangs marks, pain , edema Swelling	Blurred vision, BP 150/100 Anxiety	15	10+5	NIL	R local wound took 3weeks
2/30/m	Cobra	Right ring finger	While putting cobra in plastic bag	Pain Swelling ,fangs marks	nil	25	10+7	nil	Dry black gangrene ring finger
3/25/m	Cobra	Left little finger	Transferring cobra to glass bottle	Local edema ,pain	nil	5	10	Allergic to ASV	Gangrene of left little finger
4/35/f	Cobra	Left middle finger	While putting in plastic bag	Fang minor abrasion	Nil	20	nil	nil	Dry bite
5/28/m	Cobra	Left little finger	While putting cobra in a bag	Minor abrasion	Nil	15	nil	nil	Dry bite
6/53/m	Cobra	Right little finger	Transferring to plastic bag	Local edema	Blurred vision ,ptosis , respiratory depression	25	10+10	Ventilator for 24 hours	Local gangrene
7/35/M	Cobra	Left little finger	While transferring the cobra to plastic bag	Local edema, pain	Blurred vision	20	10+8	Nil	Recovered
8/55/M	Russell's Viper	Right thumb	While showing live specimen to school children	Local pain , swelling of arm , blebs ,	Gum bleeding 20WBCT blood did not clot	40	15	Plastic surgery of right thumb	Recovered
9/25/m	Russell's viper	Left index finger	While putting in the bag through the bag bite	Local edema, blebs, oedema of arm	Gum bleeding 20WBCT - blood did not clot	25	27	Local blebs , necrosis	Recovered
10/64/m	cobra	Right thumb	While demonstrating public and television reporter	Local edema. Echymosis	Ptosis Respiratory failure	30	20	Ventilator for 12 hours	Recovered
11/40/M	Russell's viper	Lateral maleolus of left foot	Through the bag	Local edema, echymosis , blebs	nil	30	10	Nil	Recovered

12/30/m	Cobra	Right hypothener Space of palm	While catching cobra and release of pressure over head of species	Local edema, pain , bleeding from fangs marks	nil	20	10	Nil	Recovered
13/40/m	Cobra	Right index finger	While putting in bag	Minor abrasion without local pain and edema	nil	10	nil	nil	Dry bite
14/50/m	cobra	Left middle finger	While catching cobra turned In shade of labor	Swelling	nil	10	13	nil	Recovered
15/35	cobra	Right palm space between thumb and index finger	While catching cobra without instrument	Swelling, ecchymosed , fangs marks , edema of whole palm	Ptosis , respiratory depression, dysphagia , aphonea	75	18	nil	Recovered
16/28/m	Russell's viper	Dorsum of Left index finger	While putting in bag through the cloth of bag	Swelling , ecchymosed , edema Skin gangrene	Nil	20	28	Nil	Local gangrene

Sixteen snake rescuers while rescuing snake received snake bite of these twelve rescuers were bitten by cobra. Nine had envenoming result in systemic involvement. Two had neuroparalysis; one had local tissue damage and dry gangrene. All the twelve cases recovered with intravenous snake polyvalent. One with respiratory paralysis recovered after 24 hours on ventilator. Remanding three though received snake bite but did not suffered of any local or systemic manifestations "dry bite" all of them had severe local tissue damage and one had gangrene (Table 5).

Anaphylaxis to ASV

Total 310 (19.07%) victims had developed anaphylaxis to ASV. Of these 170 (54.83%) mild and 140 (45.16%) had severe anaphylaxis. Mild reaction was responded to intravenous fluid, steroid (hydrocortisone hemi succinate) and antihistamines (chlorphenaramine maleate). While severe reaction required nasal oxygen, intramuscular adrenaline. 0.3 mg repeated very five minutes maximum required is three doses, intravenous methyl prednisone, fluids and aminophylline drip

DISCUSSION

This is the highest series of venomous snake bite study from remote rural Maharashtra. There are about 236 species of snakes seen in India, majority of them are non-venomous. Envenoming by these snakes causes anxiety and panic attacks in victims. There are 13 known species that are venomous and BIG FOUR namely cobra(Naja naja), common krait (Bungarus ceruleus) , Russell's viper and Saw scaled (Echis carinatus) viper are flourished all over India (Figure 1A,B,C,D). In present study 751(46%) are youngster of age between 21-40 and 60% are males agricultural workers were the most common affected group, making snake bite an occupational hazard. Before 2002 we reported 36% fatality due to krait and cobra bite from Mahad. This high fatality because of poor transport facilities, delayed reporting of cases, important time is killed by attending to *Tandrik* and herbal remedies and non availability of ventilator (HSB) [14,17]. Similarly irrespective of availability of ventilator the fatality due to cobra and krait bite was 19% and 9.5% reported from Mukhed (DPP) [15].

We noted that 851 (52%) snake bite cases occurred during rainy season in months of June to October. This is monsoon season when farmers are busy in farming in rural Maharashtra. Maximum cases of viper bites. Of these majority are of Russell' viper as compared to elapidae bite. While the fatality is 6.70% in krait and cobra bite.2.14 % amongst Russell's viper bite cases. This remarkable reduction in mortality in present series is attributed to availability rapid transport facilities (each village having auto, many bicycles), good road. Thus victim report earlier to hospitals. Rapid diagnosis and intervention by experienced physicians, availability of advanced ventilators, dialysis (HSB and DPP). Public is more aware of availability of treatment for snake bite report fast to the treatment centers. Early trachel intubation and artificial respiratory support helped to reduce the fatality in cobra and krait bite. Early administration of adequate dose of ASV and proper care of wound reduces disability [18]. In this study we report antisnake venom is safe in pregnancy without any effects on fetus. High rate of reaction to polyvalent antivenom is attributed to impurity of ASV. Peripheral doctors and medical officers are avoiding to administer the ASV to a venomous bite poising because of afraid of anaphylaxis. The threat of anaphylaxis can be alleviated by encouraging medical officers and peripheral doctors by prophylactic administration of adrenaline, antihistamise and steroid before admission of ASV [19]. Snake bite is a disease of poverty and neglected tropical disease, carries high fatality and disability and add to misery of poor family [7]. Our aim of zero mortality and morbidity in a snake bite poisoning in rural Maharashtra can be achieved by proper training, work shop of resuscitation, hands on ventilators , early diagnosis by clinical signs and symptoms, or by syndromes approach to snake bite poisoning [20], providing them literature ,appropriate protocol for ASV administrations and important of use simple bedside 20WBCT for re-administration of ASV [16,18]. Involving and training of non-government organization for Public awareness of snake bite and availability of treatment

centers, police actions against *tantrik or mantrik.* Proper training of wearing high sleeves shoes, torch, sticks and minimum electricity shedding at rural areas [10]. Proper use of mosquito net will prevent snake bite scorpion sting and mosquito bite alike [14,21-23].

CONCLUSION

Proper diagnosis of clinical manifestations of venomous snake bite poisoning, their treatment with appropriate dose antisnake venom, care of wound, early institution of ventilator support to neuraparlytic envenoming result in reduction in mortality and morbidity. Neutralizing circulating venom by antivenom, care of tissue oxygenation by ventilator, nutrition by nasal feeding tube, maintained urine out put and electrolytic balance are the main pillars of success in venomous snake bite poisoning.

REFERENCES

1. Banerjee RN. Poisonous snakes and their venomous symptomatology and treatment. In: progress in clinical medicine, second series, Ahuja,MMS (editor).India: Heinemann. 1978; 136-179.
2. Bhat RN. Viperine snake bite poisoning in Jammu. J Indian Med Assoc. 1974; 63: 383-392.
3. [No authors listed] Snake bite--the neglected tropical disease. Lancet. 2015; 386: 1110.
4. [No authors listed] Snake bite: time to stop the neglect. Lancet. 2010; 375: 2.
5. Bhaumik S. Snakebite: a forgotten problem. BMJ. 2013; 346: 628.
6. Alirol E, Sharma SK, Bawaskar HS, Kuch U, Chappuis F. Snake bite in South Asia: a review. PLoS Negl Trop Dis. 2010; 4: 603.
7. Pandey R. Snake Bite: A Neglected Tropical Condition. Indian Pediatr. 2015; 52: 571-572.
8. Harrison RA1, Hargreaves A, Wagstaff SC, Faragher B, Lalloo DG. Snake envenoming: a disease of poverty. PLoS Negl Trop Dis. 2009; 3: 569.
9. Warrell DA. Redi award lecture: clinical studies of snake-bite in four tropical continents. Toxicon. 2013; 69: 3-13.
10. Mohapatra B, Warrell DA, Suraweera W, Bhatia P, Dhingra N, Jotkar RM, et al. Snakebite mortality in India: a nationally representative mortality survey. PLoS Negl Trop Dis. 2011; 5: 1018.
11. Bawaskar HS, Bawaskar PH, Punde DP, Inamdar MK, Dongare RB, Bhoite RR. Profile of snakebite envenoming in rural Maharashtra, India. J Assoc Physicians India. 2008; 56: 88-95.
12. Http://www.who.int/neglected _diseases.EB132_R7_en.pdf.
13. Bawaskar HS. Snake bite poisoning: A neglected life-threatening occupational hazard. Indian J Crit Care Med. 2014; 18: 123-124.
14. Bawaskar HS, Bawaskar PH. Call for global snake-bite control and procurement funding. Lancet. 2001; 357: 1132-1133.
15. Bawaskar HS and Bawaskar PH. Profile of snakebite envenoming in western Maharashtra, India. Trans Roy Soc Trop Med hyg. 2002; 96: 79-84.
16. Punde DP. Management of snake-bite in rural Maharashtra: a 10-year experience. Natl Med J India. 2005; 18: 71-75.
17. Bawaskar HS, Bawaskar PH, Bawaskar PH. Premonitory signs and symptoms of envenoming by common krait (Bungarus caeruleus). Trop Doct. 2014; 44: 82-85.
18. Sano- Martins IS, Fan Hw, Catro SC, Franca FD, Jeorge Mt, Jorge MT, et al. Reliability of simple 20 minute blood clotting test (WBCT) as an indicator of low plasma fibrinogen concentration in patients envenomed by Botrops snake. Butan institute antivenom study group. Toxicon. 1994; 32:1045-1050
19. Bawaskar HS and Bawaskar PH. Envenoming by the common krait (bungarus caeruleus) and asian cobra (Nja naj) : Clinical manifestations and their management. Wildernesses environ med. 2004; 15: 257-266.
20. Warrell DA. Snake bite. Lancet. 2010; 375: 77-88.
21. Caron EJ, Manock SR, Maudlin J, Koleski J, Theakston RD, Warrell DA, et al. Apparent marked reduction in early antivenom reactions compared to historical controls: was it prophylaxis or method of administration? Toxicon. 2009; 54: 779-783.
22. Ariaratnam CA, Rezvi Saherriff MH, Arambepola CA, Warrell DA. Syndromic approach to treatment of snake bite in Sri Lanka based on results of a prospective national hospital -based survey of patients envenomed by identified snakes. Am J Trop Med Hyg. 2009; 81: 725-731.
23. Chappuis F, Sharma SK, Jha N, Loutan L, Bovier PA. Protection against snake bites by sleeping under a bed net in southeastern Nepal. Am J Trop Med Hyg. 2007; 77: 197-199.

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