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STUDY ON TRADITIONAL PRACTITIONERS KNOWLEDGE AND PRACTICES ON SNAKE-BITE FIRST AID AND TREATMENT IN NORTH CENTRAL PROVINCE, SRI LANKA

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ABSTRACT

Sri Lankan traditional medical snake bite practices (*Visha Vedakama*) has very long history. These traditional medical practices used by traditional practitioners for thousand years. According to the government hospital statistics North Central province is the highest snake bite rate in Sri Lanka. Objective of this study was to find out the traditional practitioners knowledge and practices related to snake-bite first aid and treatment. Sixty traditional snake bite treatment practitioners from North Central province of Sri Lanka, who had more than ten years' experience after registration, were selected randomly from the registry maintained by Ayurveda Medical Council. Before administered a questionnaire written consent was taken. The questionnaire was consisted of socio demographic characteristics, traditional first aid and treatment of snake bite patient. Out of 60 practitioners 73.33% were male and 38.3% and 25% belong to the age group of 66-75 and over 75 respectively. Majority of them (56.6%) had more than twenty years' experience and 61% of them learned the traditional medicine from their parents. The study revealed that 65% of practitioners disagree to wash the bitten area. 58.3% practitioners agreed to apply tourniquets around the limb proximal to the bite site and 70% and 83.3% were agreed to incise bitten area and apply snake stone respectively. 90% of the respondents agreed to apply lime juice to the bitten area and 100% of them prescribed anti venom herbal porridge as an immediate treatment. 91% practitioners used herbal decoctions for neutralize snake venom. It is concluded that the practitioners have adequate knowledge about snake bite first aid and treatment.

Key words – Traditional knowledge, snake bite, first aid, treatment.

INTRODUCTION: Snake-bite is a common occupational hazard of farmers, plantation workers and others, resulting in tens of thousands of deaths each year and many cases of chronic physical disabilities[1,2]. WHO estimated that among five million snake bites and 125,000 snake bite deaths each year in the world as a whole, there were two million snake-bite envenoming and 100,000 deaths in Asia[1]. Ministry of Health of Sri Lanka reported snake-bite numbers increased from 12,175 per year in 1991 to peak at 37, 244 in 2002 and 36,861 in 2005[3]. But the actual number of mortality and morbidity are different from above. A study of hospital data with death certifications in Monaragala district during a 5 year period (1999-2003) revealed a 63% underestimate by hospital records of the true number of snake-bite deaths[4] The highest rates of snake bites and envenoming were seen in the rural and agricultural North Central and North Eastern regions of the country[5]. The highest disease burden due to venomous snakebite affects areas with the population groups that are most under-served in healthcare and infrastructure.

Sri Lanka is well known for its rich snake diversity consisting of land snake species which have been clustered into different categories according to their level of toxicity including highly venomous, moderately venomous and non-venomous.

Cobra, Russell's viper, Saw scaled viper, Common krait and Banded krait are highly venomous snakes in Sri Lanka. According to Sri Lankan government hospital records there are 35,000 to 40,000 snake bite cases and 500 to 800 deaths reported in every year[6].

Sri Lanka has very long history of animal bite treatment[7]. This traditional medical system has been practiced for many centuries in the island nations. Traditional snake bite treatment practitioner is a person who is recognized by community and he lives as a competent to provide traditional treatment by using different venom removing first aid and treatment methods. Most of the people living in rural areas still seeking venom treatment from traditional practitioners.[8] A study investigating beliefs regarding snake bite and their influence on health seeking behaviour in four rural communities in Sri Lanka found that people firmly believed that traditional snake bite treatment is more effective[9]. In modern medical science anti-venom is the only treatment for snake envenomation. But anti-venoms made as antiserum can be lifesaving but are expensive, not always available and has high side effects[10,11]. Currently all anti-venoms used in Sri Lanka is supplied from India. There are limited data regarding the efficacy of Indian anti-venom against Sri Lankan snakes. Recent study showed that Indian anti-venom is not much effective for Sri Lankan snakes[12].

OBJECTIVE: To find out the traditional practitioners knowledge and practices related to snake-bite first aid and treatment

MATERIALS AND METHODS

Using cross sectional research design a total 60 traditional snake bite treatment practitioners from North Central Province were selected from the registry maintained by the Ayurveda Medical Council, Sri Lanka. Registration period limited to 30 years (January 1980 to December 2009). During the period of 30 years 191 practitioners were registered in snake bite treatment category. Out of them 60 practitioners were selected randomly. The survey was done by the principle investigator July to November 2020 and primary raw data was collected. Responses on the following topics were obtained, socio-demographic characteristics such as age, sex, working experience, medical education and the knowledge on first aid and treatment. Their written consent was taken prior to the interview. Ethical approval was taken from the Ethical Review Committee, Sabaragamuwa University of Sri Lanka. Ethical clearance number is ERC/H/03/2019/12.

INCLUSION CRITERIA

1. Both sex
2. Age between 35 to 85 years
3. Experience more than 10 years
4. The survey respondent were either sex or age between 45 to 85 years and who were registered in the Ayurveda Medical Council.

EXCLUSION CRITERIA

1. Age below 35 and over 85
2. Experience less than 10 years
3. Practitioners who had auditory and visual disturbances

OBSERVATIONS AND RESULTS

Demographic information of the study respondents

A total number of sixty respondents were selected from two districts (Anuradhapura and Polonnaruwa) in North Central Province to facilitate quantitative data collection about traditional snake bite treatment. The sample population was

included 73.3% (n=44) males and 26.7% (n=16) females. All the study respondents were belong to Sinhala and Buddhist community. Out of the respondents 86% (n=52) were above the age of 55 years and majority of them had more than 20 years' experience (56.6%). 61.6% (n=37) of practitioners obtained their medical education from their parents followed by a teacher 26.6% (n=16).

Knowledge on First aid – patients with snake-bite

Table 1: Methods used as a first aid

First aid method	Yes	Percentage	No	Percentage
Wash the bitten area	21	35%	39	65%
Apply tourniquet	35	58.3%	25	41.7%
Cauterize the bitten area	17	28.3%	43	71.7%
Incise the bitten area	42	70%	18	30%
Apply *Visha Gala* (Medicated stone)	50	83.3%	10	16.7%
Sucking venom	38	63.3%	22	36.6%

As per the Table 1, out of 60 traditional snake bite treatment practitioners 65% (n=39) disagreed to wash the site of bite and 58.3% of practitioners agreed to apply tourniquets around the limb proximal to the bite site. Cauterization of the bitten area was rejected 71.7% practitioners and 70% were agreed to incise the site of the bite and remove blood. Application of Medicated stone (*Visha Gala*) was most popular method among traditional practitioners that is 83.3% (n=50). Majority of respondent (63.3 %) used to suck venom immediate after snake bite. They use certain special instruments or devices to drawing out the venom. 42% used Steam bottle and 39% *Srunga* (Horn) for sucking out of venom.

Immediate treatment after snake-bite

Table 02: Treatment methods used by the Practitioners

Treatment method	Yes	Percentage	No	Percentage
Chanting Mantras	50	83.3%	10	16.7%
Apply lime juice	54	90%	06	10%
Apply herbal paste	44	73.3%	16	26.7%
Apply traditional oil	45	75%	15	25%
Give prepared herbal powder	41	68.3%	19	31.7%
Give herbal porridge	60	100%	00	00%
Give herbal decoction	55	91.7%	05	8.3%

According to the Table 2, 83.3% of traditional practitioners chanting Mantras before start the treatment. These Mantras are different from tradition to tradition and they did not like to disclose them to others. Majority of practitioners (90%) used to apply lime juice immediate after snake bite. 75% of practitioners were apply medicated oils to the bite site which they prepared and kept with them. Most of them used *Vishaneela thaila*, and *Vishaharana thaila* and some of them dislike to give their own recipes. Out of 60 respondents 68.3% (n=41) give prepared herbal drug as an immediate treatment. They prepared it as a powder form and give it with lime juice. All the practitioners agreed to give specially prepared herbal porridge with anti-poisonous medicinal plants and the medicinal plant is depend on the bitten

snake. 91.7% (n=55) respondents used to give herbal decoction to neutralize the venom. These decoctions also varies from snake to snake.

DISCUSSION: Venomous snake bite is life threatening condition. A snake can inject venom into subcutaneous tissues, muscle, a vein, or an artery. But some amount of venom remain around the bitten area. This venom absorb slowly little by little. From first aid methods this venom can be removed from the body before absorption and from immediate treatment venom is neutralized from anti-poisonous herbal medicaments.

Sex wise distribution of total 60 traditional practitioners 73.3% (n=44) were male and 26.6 % (n=16) were female. The age of practitioners ranged from thirty five years to eighty five years and majority were more than 55 years and also most of them had more than 20 years' experience. It was reasonable to involve more matured and well experienced practitioners in this study and most of them got traditional knowledge from their parents. Parents usually hand over their utmost knowledge and experience to their own children without hide any important matters.

Most of the practitioners agreed to apply tourniquets around the limb proximal to the bite site. Tourniquets are constricting bands that block arterial, venous, and lymphatic flow and often used as first aid after snake envenomation, especially in rural areas where transport times to a healthcare facility are increased. These are performed with a belief that venom would be released slowly and prevent the spread of venom. Similar finding was presented in a hospitalized patients in a Philippines[13]. But use of tight (arterial) tourniquets, if applied around the proximal portions of the limb, these can cause severe pain as there will be gradual development of ischemia on the limbs and can lead to gangrene[14]. 71.7% of practitioners dislike to cauterize the bitten area which cause harmful effects such as excessive bleeding and delayed healing of the wound[15]. Cauterization is contraindicated in the cases of viper bite, because viper venom aggregate *Pitta* and is increased and toxic manifestations[16]. From the study respondents 70% were incise the bitten area with the help of a sterilized instrument and remove the blood which contain poison. Usually incision is done before apply *Visha gala*. But incision should not to be done *Pitta* vitiated snakes like viper-bites because of its poison delayed clotting time and continuous bleeding will harm to the patient[17]. 83.3% of practitioners were applied a medicated stone with anti-poisoning properties to the affected snake bite area. Drawing out of venom using the *Visha-gala* is the chief method generally used by the Sri Lankan traditional physicians and they possess a wide variety of such stones according to the tradition and ancestry of snake-venom treatment that they belong to. The *Visha-gala* is kept pre-prepared and when a patient bitten by a snake is presented, the physician will apply this stone to the bite site after cleaning and broadening the site. When thus applied the *Visha-gala* will adhere to the bite site and after the venom is drawn out it will automatically fall off. After used once for this purpose the stone should be kept submerged in Lime juice, then dried and used again similarly. Spittel who was a qualified surgeon has stated that he also once witnessed successful use of snake stone in a case of a gypsy bitten by a cobra.[18] Out of the study respondents

63.3% (n=38) agreed to suck venom as a first aid. Sucking out of venom is a treatment modality of paramount importance used by the ancient traditional physicians to remove the snake venom before it is absorbed by the human body. For this process of *Visha Irima* (sucking venom) the traditional physicians even employed certain special equipment or devices for the process of drawing out of venom. Respondents in this study used steam bottle and *Srunga* (horn) 26.7% (n=16) and 25% (n=17) respectively but very few of them sucked poison by mouth which was 5% (n=3). Poison can be sucked by mouth, steam bottle, a hone (*Srunga*), *Visha gala* (medicated stone) and sliced *Ingin*i seed[19.]

As immediate treatment 83.3% (n=50) practitioners used to chanting *Mantra.* They believe poison can be neutralized by recitation of *Mantra*. According to *Chakrapani Mantra* as primary and par excellence treatment method which reverses the poison[20]. 90% (n=54) of traditional practitioners agreed to apply lime juice to the bitten area for the neutralization of the venom. Similar study showed that *Citrus aurantifolia* (lime fruit) has clear ability to neutralize the venom toxicities both cobra and viper[21]. But 65% (n=39) of them rejected to washing the bitten area. According to them, it will affect to delay the healing of wound and reducing the oedema.

Majority of practitioners (73.3%) used to apply freshly prepared herbal paste to the snake-bite area. Most of them used *Heen Undupiyali (Desmodium triflorumi)* leaves with lime juice as immediate treatment. Anti-toxic herbal local applications are more effective treatment for local tissue damage. According to the following studies proved that the possible advantages of anti-toxic plants and their low cost, easy access, stability at room temperature, and ability to neutralize a broad spectrum of toxins, including local tissue damage[22,23,24,25], 68.3% (n=41) of respondents in this study had prepared anti toxic herbal powder for immediate use. They used to give this powder with lime juice as an initial treatment. It consisted of eight herbal medicines. All the practitioners agreed to give herbal porridge as early treatment. Specially prepared herbal porridge has anti toxic medicinal effect as well as nutritional effect[26].Over 91% (n=55) of practitioners in this study prescribed decoctions for their patients as an internal treatment. The recipe of the decoction is depend on the type of bitten snake and the condition of the patient.

CONCLUSION: In conclusion, the data presented in this study provides an application of medicated stone lime juice are more effective first aid methods for snake bites and antitoxic herbal porridge and specific herbal decoctions are the most effective immediate internal treatment after snake-bite. This study revealed that majority of traditional practitioners have adequate knowledge and practices about snake-bite first aid and treatment. But need to upgrade their knowledge and skills related to harmful effects to ensure the health and safety of the victims of snakes. This traditional knowledge has to be protected for the wellbeing of the future generation.

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.Competing Interests

Authors have declared that no competing interests exist.

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