

Antidotes: Where are they when needed?

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It is estimated that nearly 45,900 people in India die of snake bite,—the highest mortality rate in the world for snake bite.^[1] Those who die are from the lower socioeconomic groups, such as farmers, villagers, children, and those with very little publicity value for the media. Polyvalent antsnake venom (ASV) is widely available, manufactured in India and is the antidote of choice. Yet, primary health centres (PHCs) stock one or two ASV vials at any given point of time. This is not enough even for a single patient. The reasons why large amounts of ASV are not stocked in PHCs are varied. ASV is a costly medicine, and chief medical officers are hesitant to leave large stocks in the PHCs for fear of misuse/pilferage by the personnel. At times these drugs are not used till they are found to have expired, which provokes an audit objection, which in turn starts a circle of queries that everyone wants to avoid. Therefore, PHCs are stocked with just one or two vials of ASV, a volume too small for the management of snake-bite, but enough to satisfy audits by higher authorities when asked whether ASV is available in the PHC. Precious little is being done to address the issue of unavailability of ASV in adequate dosage at the point of first contact for care.^[2] This is poverty amidst plenty playing out with a deadly outcome. It seems rather sad that at a time when noncommunicable diseases and other lifestyle diseases are getting the attention of health policy makers, this neglected problem is remaining exactly the same. There have been questions in the Lok Sabha from time to time regarding death due to snake bite and the availability of ASV.^[3] However, the answers to the questions are cloaked in politically correct language which neither mirrors nor distorts

the truth giving statistics that are far from being near the real figures.^[2,3] It will suffice to say that almost nothing that will make a real difference is being done to save the lives of these unfortunate victims.

Scorpion sting is another problem which is widespread in South India, but not so in the northern parts of the country.^[4] The antidote for this venom was never widely or easily available in the country, though manufactured in India. Excellent results in the management of these cases with prazosin has decreased the number of deaths.^[4] Yet, many times this cheap drug is not available in PHCs or even in referral hospitals. Prazosin and scorpion antivenom do not find a place in the antidote section of the National Essential Medicines List of India. The morbidity and mortality could be easily brought down without much cost involved. Why then is this problem not getting the attention it deserves?

Nearly 40 people died recently in Uttar Pradesh, as a result of consuming illicit liquor brewed near their villages.^[5] While there is no exact figure on the number of deaths which occur annually from time to time due to this reason, the sad common denominator is that all the people who die are poor, mostly live in villages and are almost always healthy males who are the breadwinners for their families. The antidote for methanol poisoning is parenteral ethanol or fomepizole, both of which are not readily available in India. Hence, the management of these patients is purely dependent on the supportive care, which at the peripheral level will be largely inadequate to save many of these lives. The truth seems to be that no one is ready to recognize this problem and address the issue of making sure that these antidotes are made available at the places where it is needed.

Lead and other heavy metal poisoning from traditional medicines is another story which is constantly swept under the carpet.^[6] The national pride exhibited by us when speaking of

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the traditional systems of medicine does not match the efforts taken by us to maintain standards during production of these products. Hence, we are all consumed by a curtain of silence when it comes to investigating the reason for the many cases of lead poisoning by Ayurvedic drugs. It is time that we stopped maintaining that the ancient texts got it right and we have got it wrong. As scientists, we need to start with an open mind and use the best available scientific methods at our disposal to verify what is going wrong with these products. Though the antidotes for lead are known, the availability is scarce and the diagnosis of lead poisoning is rare as it falls outside the radar of most clinicians.

One of the commonest suicidal poisonings seen in India is organophosphorus poisoning. The antidotes, atropine, and pralidoxime are common drugs which are also easily available. Yet, pralidoxime is not stocked in PHCs. Precious time is lost till the patient is transported to the referral hospital which stocks pralidoxime by which time it will be too late for this antidote to be given. Many of the referral hospitals do not stock the atropine of required volume for infusion and hence doctors are expected to break many 1 ml ampoules containing 0.6 mg/ml in order to start an infusion. The National List of Essential Medicines of India (NEML), 2011, lists the strength of atropine as 1 mg/ml without the volume being mentioned. The World Health Organization (WHO) Model Essential Medicines List (EML) 2013, specifies it in the same way, giving the volume as 1 ml in ampoules. Only Sri Lanka, lists atropine as 15 mg/25 ml in their EML which is indicative of the critical manner in which the list is being prepared in that country. A comparison of the antidotes listed in the EMLs of India, Sri Lanka, Nepal, Bhutan, and Bangladesh, all neighboring countries in the South-East Asia region with the WHO Model EML of 2013 in Table 1, shows that India has most of the necessary drugs in its NEML. However, important antidotes like ethanol and fomepizole are missing and access to these drugs is found wanting.

There needs to be a sea change in the manner in which we treat victims of poisoning. There must be a cry for better availability of antidotes, more responsible drug supply chain management, optimal use of available guidelines in clinical management, and innovative methods of quickly transporting these patients to the nearest referral hospitals as they have initiated in Nepal. The poison centers in the country must go beyond their self-limiting role of giving advice and documenting the evidence. They need to play a proactive role in the management. These centers should be the first responders for medical emergencies and assist the hospitals and health centers in getting the medicines needed for treatment. With the kind of information technology resources at our disposal and the connectivity that India boasts of even to remote areas, we should be able to bring the antidotes closer to the patients. It may need

Table 1: Comparison of the list of antidotes in the essential medicines lists of Bangladesh, Bhutan, India, Nepal, and Sri Lanka with the 18th model essential medicines list of the world health organization

Antidote	WHO-EML	BAN	BHU	IND	NEP	SLK
Activated charcoal	Yes	No	No	Yes	Yes	Yes
Acetyl cysteine	Yes	No	No	Yes	Yes	Yes
Atropine	Yes	Yes	Yes	Yes	Yes	Yes
Calcium gluconate	Yes	Yes	Yes	Yes	Yes	No
Methylene blue	Yes	No	No	Yes	Yes	Yes
Naloxone	Yes	Yes	Yes	Yes	Yes	Yes
Penicillamine	Yes	No	No	Yes	No	Yes
Prussian Blue	Yes	No	No	No	Yes	No
Sodium nitrite	Yes	No	No	Yes	Yes	Yes
Sodium thiosulfate	Yes	No	Yes	Yes	No	Yes
<i>Deferoxamine</i>	Yes	No	No	Yes	Yes	Yes
<i>Dimercaprol</i>	Yes	No	No	Yes	Yes	Yes
<i>Succimer</i>	Yes	No	No	No	No	No
<i>Sod cal edetate</i>	Yes	No	No	No	Yes	Yes
<i>Fomepizole</i>	Yes	No	No	No	No	No
<i>Antisnake venom</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Pralidoxime</i>	No	No	Yes	Yes	Yes	Yes
Flumazenil	No	No	Yes	Yes	No	Yes
D-L methionine	No	No	No	No	No	Yes
Ethanol	No	No	No	No	Yes	Yes
Fuller's Earth	No	No	No	No	No	Yes
Deferiprone	No	No	No	No	No	Yes

WHO-EML=World health organization essential medicines list, BAN=Bangladesh, BHU=Bhutan, IND=India, NEP=Nepal, SLK=Sri Lanka. The drug names in italics are in the complementary list of the WHO EML 2013. Yes and No refers to whether the drugs are listed in the EMLs of the respective countries

innovative planning and implementation at various levels and a mind-set which refuses to accept these unnecessary deaths. It would also mean that each person who would be involved in the management has to do their bit including the pharmaceutical companies, policy makers, chief medical officers, pharmacists, doctors, and media. There needs to be a loud and clear call from all of us to improve these dismal statistics. No man, woman, or child should die for want of one of these antidotes and any excuse to the contrary would be simply unacceptable.

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