

A review on antidotes in contemporary science and ayurveda

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Abstract

Many drugs have been used for therapeutic purposes in Ayurveda since the Vedic period, and they are either of plant (*Sthavar Udbhava*), animal (*Jangam Udbhava*), or metal, mineral (*Khanija*) origin. After the period of *Acharya Nagarjuna*, the use of metals, minerals, and poisonous drugs became prevalent. *Agada Tantra* is a branch of Ayurveda that deals with the treatment of various poisons. Toxicology is concerned with the identification and management of various types of poisons, including those derived from plants and animals. Various poisons have been described, and various antidotes for their management have been mentioned in *Agada Tantra* texts. A poison is a substance that, when introduced into or applied to the body, has the potential to harm or destroy life. It causes tissue damage, illness, or death in the organism. *Visha* is the substance that causes sadness in the world. It was given the name *Visha* because it makes the rest of the world despair. It damages tissues and causes illness or death in the organism. *Visha* is the substance that causes sadness in the world. It was given the name *Visha* because it made the rest of the world despair¹. The drugs known as antidotes are used to neutralise or disable the effects of poison. As we can see from the current paper, antidotes play an essential role in the treatment of poisoning. A doctor's primary goal is to preserve the patient's life. For proper treatment, the concept of *Prativisha*, which has been around since the past, needs to be expanded upon, clarified, updated, and narrated.

Key words: *Visha*; *Agada Tantra*; Antidote; Poison

1. Introduction

Agada Tantra is one of the eight branches of *Ashtang Ayurveda*, which deals with the treatment of various poisons. If we look at modern toxicology, it deals with a variety of poisons, including those with plant and animal origins as well as their management. *Visha* is the substance that, as soon as it enters the body, vitiates healthy *dhatu*s or kills healthy individuals², while *Visha* is the substance that brings sadness to the world³. An antidote is a chemical compound that blocks or reduces the effects of a poison⁴. The word for an antidote in *Ayurveda* is *Prativisha*. *Prativisha* is one of the *Chaturvimshati upakramas*, according to Charak⁵. In *Ashtanga Sanghrah Uttara sthana 48th Adhyaya*, *Prativisha* is explained in detail. After the fifth stage has ended and before the seventh stage has begun, if the effects of poisons have not subsided despite the use of medicinal hymns and medications, *Prativisha* must be administered with the patient's permission⁶. The poisons, in any form, may be inhaled or swallowed, absorbed through the skin after being implanted by stings, bites, or other wounds, or absorbed through the mucous membrane, which is thinner and more delicate.⁷ According to *Acharya Charaka*, a *Visha* (poison) can turn into a very good *oushadha* if it is administered correctly, but an *oushadha* can also turn into poison if it is administered incorrectly. The ancient tradition of the *vishavaidya sampradaya* is described in *Vishavaidyajyotsnika*, along with a *mantra chikitsa* that was written in the regional language of Malayalam, reaffirming the book's relevance. *Vishavaidyajyotsnika*'s name means "moonlight that gives the eternal happiness from heart"⁸. *Basavarajeyam* is a well-known Ayurvedic treaty that is widely used by Ayurvedic physicians. In the 23rd chapter of "Visharoganidhanalakshana adhyaya," the author clearly mentions various poisons and their antidotes.

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Aims and objectives

Review the effects of the antidote described in *Visha* in Ayurvedic texts as well as the contemporary antidote.

1.1. Definition of antidote

The drugs called antidotes are used to prevent or lessen the effects of poison. The term comes from the Greek *Pharmacon*, which means “remedy”. They are also known as reversal agents.

1.2. Classification of antidotes

1.2.1. Mechanical/ physical antidote⁹

They either prevent the absorption of poisons or mechanically neutralise them.

1.3. Activated charcoal

It is a powder that is fine, black, odourless.

It works mechanically by adsorbing and retaining organic and, to a lesser extent, mineral poisons within its pores, delaying absorption from the stomach.

It is ineffective against corrosives, heavy metals, cyanide, hydrocarbons, and alcohol.

With 8 ml of diluent per g of charcoal, the initial dose is 60 to 100 g for adults and 15 to 30 g for children.

When a substance travels through the gastrointestinal tract, the pH of the environment changes, which may cause adsorption and the release of the harmful chemical.

1.3.1. Demulcents

These include things like milk, starch, egg white, mineral oil, milk of magnesia, aluminium hydroxide gel, etc. that form a protective coating on the gastric mucous membrane and prevent poisons from damaging it.

Oil-soluble poisons such as kerosene, phosphorus, organophosphorus compounds, DDT, phenol, turpentine, aniline, acetone, carbon tetrachloride, etc. shouldn't be used with fats or oils.

1.3.2. Bulky food

By trapping the glass powder's particles within its meshes, acts as a mechanical antidote and protects against damage caused by the sharp glass particles.

1.4. Chemical antidote¹⁰:

When exposed to poison, they counteract its effects by oxidising it or forming harmless or insoluble compounds. Examples are:

- Common salt decomposes silver nitrate by direct chemical action, forming the insoluble silver chloride.
- Albumin precipitates mercuric chloride.
- Dialysed iron is used to neutralise arsenic.
- Copper sulphate is used to precipitate phosphorus.
- Potassium permanganate has oxidising properties. 1:5000 solution is used in poisoning for opium and its derivatives, strychnine, phosphorus, hydrocyanic acid, cyanides, barbituric acid and its derivatives, atropine and other alkalis. When it reacts with the poison in the stomach, it loses its pink colour. The wash must be continued till the solution coming out of the stomach is of the same pink colour as the solution put in.
- A solution of tincture iodine or Lugol's iodine 15 drops to half a glass of warm water precipitates most alkaloids, lead, mercury, silver, quinine and strychnine.
- Tannic acid 4%, or tannin in the form of a strong tea or one teaspoonful of tannic acid in water tends to precipitate apomorphine, cinchona, strychnine, nicotine, cocaine, aconite, pilocarpine, lead, silver, aluminium, cobalt, copper, mercury, nickel and zinc.

- Alkalis neutralise acids by direct chemical action. It is safer to give little weak solution of an alkaline hydroxide, magnesia or ammonia. Bicarbonate should not be given, because of the possible risk of rupturing the stomach due to liberated CO₂.
- Acids neutralise alkalis by direct chemical action. Only those substances which are by themselves harmless should be given, e.g. vinegar, lemon juice, canned fruit juice. Neutralisation of acids with alkali and vice versa should be avoided because exothermic reaction of neutralisation can cause additional injury. So called universal antidote consisting of a activated charcoal, or burnt toast 2 part, Magnesium oxide one part and tannic acid or strong tea one part is not recommended.

1.5. Physiological or pharmacological¹¹

They work on the body's tissues and cause symptoms that are completely different from those brought on by the poison. They are administered after some of the poison has entered the bloodstream.

By obstructing another's ability to act on tissue cells, nerve systems, or enzymes, these agents work on the antagonism principle.

Atropine and physostigmine are two true physiological antidotes because they both affect nerve endings and have opposing effects on heart rate, pupillary state, and glandular secretory activity.

Cyanides and amyl nitrite are two other examples.

1.6. Chelating agents¹²

Chelating agents (metal complexing agents) are used to treat heavy metal poisoning. When compared to endogenous enzymes, they have a higher affinity for metals. The agent-metal complex is more water-soluble than the metal itself, resulting in greater renal excretion of the complex. They have the ability to form stable, soluble complexes with calcium and other heavy metals.

1.7. Prativisha

Prativisha is an antidote to *visha*.

It consists of just two words: *Prati* + *Visha*. '*Prati*' means against and '*Visha*' means those destroy body. The medication used to calm *Visha Utpanna Lakashana* is called *prativisha*.

1.7.1. Need of *prativisha*¹³⁻¹⁶

By emesis or gastric lavage, the poison might not have been entirely eliminated.

The poison has already been absorbed.

The poison/toxin was introduced by means other than ingestion.

1.7.2. Indications of *prativisha*¹⁷⁻¹⁸

- When the poison's effect is not alleviated by *Mantra-Tantra* procedures and other *Aushada Upakarma* and medication management.
- When *Visha-Pidita* has reached the 5th *Vega* but has not yet reached the 7th *Vega*. That is, either in the 6th or 7th *Visha Vega*.
- In an emergency situation or when all other therapeutic options have been exhausted, the *Prativisha* should be administered.

1.7.3. Contraindications of *prativisha*¹⁹

To determine if a person is poisoned or not.

Agada administers once the 7th *Visha Vega* expires.

Prativisha should not be used when the poison is localised to a small portion of the blood.

The use of *Prativisha* in a person who drinks *Ruksha Aahar* (dry food) causes visual problems, ear ache, and *Vatavyadi*.

Prativisha should not be taken during the rainy season or on cloudy days.

Those who are irritated and suffering from *Pitta* disorders.

Those who are dry (very thin) and in pain due to a key organ ailment.

1.7.4. Dose

For *Jangma Visha*: The dosage of *Stavara Visha* should be used²⁰

4 *Yava* for *Heena Matra* (Minimal Dose)

6 *Yava* for *Madhyama matra* (Moderate dose)

8 *Yava* for *Uttam Matra* (Maximum dose)

For *Keeta damsha* - 2 *Yava*

For *Vruschika damsha* - 1 *Tila*

For *Luta damsha*²¹ - External application after *Pracchana* karma

1.8. How does antidote works

A drug or procedure that neutralises a poison or its effects. An antidote may function by lessening or preventing the stomach's ability to absorb a poison. By taking a substance to neutralise an acid, for example, it may directly counteract its effects. Alternately, a poison may be blocked at its receptor by an antidote²². Antidotes work by a number of different mechanisms, including forming an inert complex with the poison, speeding up detoxification, slowing down the poison's conversion into a more toxic compound, competing with the poison for key receptor sites, blocking key receptors that mediate the toxic effects, and avoiding the poison's effects altogether²³.

1.9. Ghee as an antidote

Ghee has been referred to as the preferred medication for treating poisons in ancient Ayurvedic texts. Ghee has characteristics similar to those of *Oja*, making it useful in poisoning, according to *Charak*²⁴.

Ghee has the property of being a destroyer of poisons, according to *Acharya Vagbhata*. He also makes it clear that it is the best treatment for all types of poisonings²⁵. As a result, ghee should be used either alone or in combination with other anti-poison medications to treat poisoning patients. In the case of *Alark Visha* and *Vrischika Visha*, *Agnikarma* with boiling ghee is also recommended as the specific treatment²⁶.

1.10. Madhu as an antidote

According to *Acharya Shushruta* and *Vagbhata*, madhu has the quality of being a poison destroyer and is the best treatment for all types of poisonings, regardless of the patient's condition.^{27,28}

1.11. Godughda as an antidote

Similar to *Ojas*, *Kshira* acts as *Rasayan*, *Balavardhaka*, *Hrudya*, *Jeevaneeya*, and *Ayushya*²⁹.

1.12. Swarna bhasma as a antidote

According to *Acharya Bhavaprakash*, swarna is the best *Rasayan*, *Ojaskara*, and is beneficial in both *Visha* conditions, namely *Jangama Visha* and *Sthavara Visha*.³⁰

2. Discussion

People have been exposed to poisoning on a daily basis since ancient times, which has resulted in major health problems. Antidotes are used in Ayurveda to treat poisoning. Antidotes are pharmaceuticals that stop the progression of negative

health effects brought on by exposure to exogenous substances, such as drugs, metals, and poisons³¹. The usage of antidotes is dependent on the clinical indication and the product's availability. Plant, animal, and mineral products are readily available antidotes. The majority of the antidotes discussed in this literature are plant and animal items. *Swarasa* is commonly used as an antidote to plant products. Milk is commonly used as an antidote to animal products.

The probable mode of action of each antidote can function with the concept of incompatible action for each other, as we have seen in day-to-day practice, where we can observe alcoholic patients who drink too much alcohol and then use lemon juice to lower the toxicity of the liquor. Similarly, *Neeri* Root is used to treat *Langali* toxicity. We can use ethanol for methanol poisoning and other antidotes for research purposes. As a result, an attempt has been made to consolidate everything in one publication.

3. Conclusion

Ayurveda recognises the necessity of *Prativisha* (Antidote) in counteracting poisonous possessions. *Visha* has virtues such as *Laghu*, *Aashu*, *Sukshma*, *Vyavayi*, *Vikashi*, and others that will penetrate *Sukshmatikushta* and work fast. Ayurveda has described various antidotes that are widely available. The highest poisoning death rate in the world is seen primarily in lower socioeconomic strata, with minimal publicity for emergency treatment. This article has discussed various specific antidotes that are widely available. This is the time to stimulate additional research on the antidote, for new and improved antidotes, and its action in various modes of poisoning conditions.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflict of interest.

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