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## A Review on Mercury Poisoning and Its Treatment According to *Bhaishajya ratnavali*



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### ABSTRACT

Mercury poisoning is one among the common poisoning condition seen in public health concern. Mercury is widely utilized in industries and for a variety of therapeutic applications, making it a frequent cause of poisoning in society. Mercury poisoning and its treatment are thoroughly described in modern toxicology texts, however in *Ayurveda* it is only covered in few literatures, *Bhaishajya ratnavali* is one among them. It is an Ayurvedic literature written by Shri Govind Das. The author has dedicated a separate chapter by name *Paradavikarachikithsa* and thoroughly explained about the importance, source of exposure, clinical features, its treatment, do's and don'ts. The source of exposure and clinical features told in *Bhaishajya ratnavali* are much similar to that of description seen in modern toxicology texts. In addition to the formulations, the author has focused more on reducing the discomforts caused by mercury exposure. Hence an effort is made to explore the details told regarding different aspects of mercury poisoning in *Paradavikarachikithsa* of *Bhaishajya ratnavali*.



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## INTRODUCTION

Any substance if, taken in any account, by any route, produces harmful effect (i.e., disease, deformity or death) over the body then it will be called as poison<sup>1</sup>. Mercury is a metallic poison which holds a great deal of significance in both *Ayurveda* and Modern Toxicology. In *Ayurveda* it is claimed to have originated from semen of Lord Shiva<sup>2</sup>. It is a component of several formulations in *Ayurveda* which are prescribed for variety of illnesses. In addition to its therapeutic benefits, it has adverse effects on the body if it is not purified. According to *Ayurveda* literatures it is having eight *doshas* namely *Vishaor Garala*, *Vahni* or *Agni*, *Mala*, *Naga*, *Vanga*, *Chapalya*, *Giri* and *Asahyagni* which causes *Mruthvu* or *Marana* (death), *Santapa* (rise in body temperature), *Jadya* (heaviness), *Vrana* (wound), *Kushta* (skin diseases), *Sukraksaya* (depletion of Semen), *Sphota* (boils over skin) and *Moha* (delirium) respectively<sup>2</sup>.

In current era mercury is used in different industries like thermometer, ceramics, dry cell batteries, electrical appliances, explosives, fireworks, mercury vapor lamps, paints, pesticides etc. and therapeutically like antiseptics, disinfectant, dental amalgam, diuretic, purgative etc. which makes the person to get more exposure to mercury leading to acute or chronic mercury toxicity<sup>3</sup>. Mercury poisoning and its treatment are thoroughly described in modern toxicology, however in *Ayurveda* this is only covered in few literatures, *Bhaishajya ratnavali* is one among them. The author has dedicated a separate chapter by name *Paradavikara chikithsa* and thoroughly explained about the importance, source of exposure, clinical feature, its treatment, do's and don'ts<sup>4</sup>.

## MATERIAL AND METHODS

A literature review was carried out through various *Ayurvedic* texts, modern texts and internet sources about the mercury poisoning and its management.

## IMPORTANCE OF PARADA<sup>5</sup>

The purified *Parada* (Mercury) keeps away ageing and death, whereas the raw *Parada* (Mercury) is dangerous. The consumption of *Parada* (Mercury) can be fatal because it is as good as poison itself. By systematically ingesting *Parada* (Mercury), all human ailments can be cured. On the contrary, unregulated use of its leads to various diseases. Hence those who don't have knowledgeable, should take medicines in the manner recommended by scholars.

## SOURCES OF EXPOSURE<sup>6</sup>

1. Staying close to mercury steam or inhaling mercury through other ways.
2. Excessive intake of purified mercury.

## SIGNS AND SYMPTOMS<sup>7</sup>

*Nasabanga* (sinking of the nose bridge), *peenasa* (rhinitis), *dantapatana* (premature falling of teeth), *netraroga* (diseases of eyes), *mukharoga* (diseases of mouth), *visarpa* (herpes), *kota* (wheels), *kandu* (itching), *mastakapeeda* (discomfort in head), *vaivarnya* (discoloration), *nasakshata* (damage to nose), *vedana* (pain), *shotha* (edema), *granti* (tumor) in *andakosha* (scrotum), *pakshagata* (paralysis), *asthipadahastadaha* (burning sensation in bone, palm and soles), *chittavikruti* (mental illness), *bhagandara* (fistula), *kushta* (skin disorders), *upadamsha* (chancre) etc. are seen.

Due to mercurial poisoning *dantavestana* (falling of teeth), *sarakta* (reddishness) *mruduta* (softness), *shvayatu* (swelling) and *kshata* (damage) of teeth will occur. There will be *suchivyada* (prickling pain) and *bahuchidrata* (pores) in gums. There will deposition of *mala* (dirtiness) and *shithilata* (loosening) of teeth. There will be *lalasrava* (excessive salivation) and *dhatu rasa swada* (metallic taste) in the mouth. There will be formation of *shotha* (edema) and *darunata* (damaged) in tongue. The body becomes *krusha* (lean). It causes *galashundi* (tonsillitis), *granti* (tumor) or *shotha* (swelling) in *gala* (throat), *karna* (ear), *hanu* (mandible region).

The excessive intake of purified mercury can lead to *tojawara* (fever), *shariraindriyashaitilya* (loosening of body and organs), *dantapata* (falling of teeth), breaking of *hanvasti* (mandible), *mukavidradi* (mouth ulceration), *raktapitta* (bleeding disorder) and *pandu* (anemia).

Inhaling mercury can cause *kampa* (stammering), which starts in the *vadana* (face) and eventually spreads to the arms and legs. The patient's *mamsapeshi* (muscles) become incredibly *durbala* (weak), and their perceptions are impaired.

**Table No.:1 Similarity between feature told in *Bhaishajya ratnavali* and Toxicology texts<sup>7,8</sup>**

Feature told in <i>Bhaishajya ratnavali</i>	Features told in Toxicology texts
<i>Sutabhashpaatinishevana</i>	Inhalation way of exposure
<i>Atimatrasevana</i>	Ingestion way of exposure
<i>Kampa</i>	Danbury tremor, Hatter's shakes and <i>Concussio mercurialis</i>
<i>Dantapatana, dantavestana,</i>	Loosening of teeth
<i>Vaivarnya</i>	Pink disease
<i>Netraroga</i>	Mercuria lentis, Visual blurring
<i>Rakta pitta</i>	Hematemesis
<i>Kushta, kota</i>	Mercury dermatitis
<i>Dhatu rasa swada</i>	Metallic taste
<i>Lalasarava</i>	Ptyalism, Sialorrhea
<i>Chittavikruti</i>	Mercurial erethism, Delirium, Insomnia
<i>Mukharoga, suchivyada, bahuchidrata</i>	Corrosion of mouth and tongue, Glossitis, ulcerative gingivitis, blue line on gums etc.
<i>Mastakapeeda</i>	Headache
<i>Jwara</i>	Fever
<i>Krushata</i>	Emaciated body

## TREATMENT<sup>9</sup>

➤ *Shudha Gandaka* (purified Sulphur) mixed with Honey has to be taken internally.

Method of use /Administration: Taken in a dose of 4 *Ratti* (~500mg), twice or thrice a day.

Therapeutic benefits: Taking pure Sulphur cures the damage caused by mercury poisoning and treats all of its ill effects. The patient's body returns to its original color and radiance. It is said that there is no better medicine of mercurial poisoning than this.

➤ *Triphaladi Kwatha*

Ingredients: *Triphala* (Combination of *Emblica officinalis Gaertn*, *Terminalia chebula Retz* and *Terminalia bellirica Roxb*), *katuki* (*Picrorhizakurroa*), *shatavari* (*Asparagus racemosus*),

*patolapatra (Trichosanthes dioica Roxb), amrita (Tinospora cordifolia), parpata (Fumaria parviflora Lam)* and water.

Process of Drug-Making: All the ingredients to be taken in equal quantity and make coarse powder and mix them together. Take 2 *tola* (~24 gm) measure of this mixture and make into decoction by adding water measuring 32 *tola* (~384 ml). When the original quantity is reduced to one fourth, remove the preparation from the stove and filter it.

Method of use /Administration: Taken every day internally.

➤ *Tiktadi Kwatha*

Ingredients: *Katuki (Picrorhizakurroa), amrita (Tinospora cordifolia), anantamula (Hemidesmus indicus R.Br.), mahasravanika (Sphaeranthus indicus Linn), shatavari (Asparagus racemosus Wild), haritaki (Terminalia chebula Retz), Shyamalata (Cryptolepisbuchananii), kakamachi (Solanum nigrum Linn), kantakari (Solanum xanthocarpum Linn), jivanti (Leptadenia reticulata Retz), bilva (Aegle marmelos Corr), amalaka (Embllica officinalis Gaertn)* and water.

Process of Drug-Making: Take equal parts of the ingredients, make into coarse powder and mix it. Prepare the decoction in the manner suggested in *Tripahalakwatha*.

Method of use / Administration: It should be consumed daily.

Therapeutic benefits: This decoction cures one from the poisoning of mercury.

➤ *Sarivadyaavaleha*

Ingredients: *Sariva (Hemidesmus indicus R.Br.), water, Shatavari (Asparagus racemosus Wild), katuki (Picrorhizakurroa), guduchi (Tinospora cordifolia), triphala (Combination of Emblica officinalis Gaertn, Terminalia chebula Retz and Terminalia bellirica Roxb), nisotha (Operculina turpethum Linn), herbs of the jivaniyagana (Vitalizing group), trayamana (Gentian kurroa Royle Linn)* and milk.

Process of Drug-Making: Obtain *tulapramana* (~5 kg) of *sariva* and get it finely powdered. Cook it into water measuring 1 *drona* (~12 kg.288gms) so long as the original quantity is reduced to one fourth part. Add to this, the fine powder measuring 2 *aksha* (~24 gm). Each of the following: *shatavari, katuki, guduci, triphalā, nishotha, herbs of the jivaniyagana. Triphala* group and *trayamana*. Cook again the preparation like an *avaleha* (linctus) and add to it honey measuring 8 *pala* (~384 gm).

Method of use / Administration: This drug should be taken in doses of 1 *karsha* (~12 gm) along with milk.

Therapeutic benefits: This drug effectively treats the mercurial poisoning as well as other diseases such as blood related ailments, *pidaka* (eruption), *upadamasha* (chancre), twenty types of *prameha*(diabetes) and other similar diseases. It increases the strength, luster and digestive power of person who takes it.

- For thirsty- the patient should take the *narikelapaya* (coconut water) and also the *mudgayusha* (soup of kidney beans) along with sugar.
- For hot belching – he should take meals along with *dadhi* (curd) and *odana* (cooked rice) of black fish treated with *jeeraka* (cumin seeds). He should also apply the ointment named *NarayanadikaTaila* on the palms and the soles.
- For restlessness- he should take bath with cold water and also his forehead should be plastered with wet pieces of white cloths.
- All the decoctions and formulations including *guggulu* (*Commiphora wightii*) suggested in the chapters of *vatarakta* (gout) and *kushta* (skin disorders) should be taken in cases of mercurial poisoning.
- Apart from that the patient should try all the *swarasa*(extracted juice), *bhasma* (incinerated ash), *churna*(powder), *kwatha* (decoction), *avaleha* (linctus) and *vati* (tablet) types of different dosage of medicines as well as the *Maharudra guduchi taila*, *Vranaraksasa taila*, *Bruhat Marichadi Taila* and *Anantadyataila* suggested in treatment of *Upadamsha* (chancre).

### DO'S AND DON'TS

Author has told to follow the Do's and Don'ts suggested in the chapter of *vatarakta* (gout) in the cases of mercury poisoning<sup>10</sup>.

In *vatarakta chikithsa* it said that, for initial stage one should get external therapies like *abhyanga* (oil massage), *abhyanjana* (bathing) etc. When the disease is serious, one should take treatment by *snehapana* (taking oily eatables), *asthapana basti* (decoction enema), *virechana* (purgation) and *raktamokshana* (bloodletting) therapy. Generally, *abhyanga* (oil massage) of *Satadhauta Ghritamand abhyanjana* (bathing) with milk of *aja* (sheep) is useful

in such cases. Other useful edibles in this case include *yava* (barley), *shashtika* and other varieties of rice, *goduma* (wheat), *mudga* (kidney beans), milks of *aja* (goat), *mahisha* (buffalo) and *gow* (cow) and non-vegetable preparations prepared out of the meats of *lava*, *tittira* and other varieties of birds. Also good are the leafy vegetables involving *uopodika* (malabar spinach), *kakamachi* (*Solanum nigrum* Linn) and the like<sup>11</sup>.

A patient should avoid indulging in *divaswapna* (daytime sleeping), *agnisantapa* (exposing to fire), *vyayama* (exercising), *atapa* (staying under sun), *maithuna* (coitus), *masha* (black gram), *kulatta* (horse gram), *nishpava* (flat beans), *kshara* (alkali) products, flesh of *ambuja* (aquatic) and *anupadesha* (marshy) animals, *virudha* (taking incompatible eatables), *dadhi* (yogurt), *ikshu* (sugarcane), *mulaka* (radish), *madya* (alcohol), *pinyaka* (oil cake), *amlakanji* (sour drink), *katu* (pungent), *ushna* (hot), *guru* (heavy to digest), *abhisyandi* (causes obstruction to the channels) and *lavanasaktu* (salty gruel)<sup>12</sup>.

## DISCUSSION

Mercury poisoning is one among the common form of poisoning seen in public. Mercury is considered by World Health Organization as one of the top ten chemicals or groups of chemicals of major public health concern<sup>13</sup>. In *Bhaishajya ratnavali* details regarding source of exposure, a wide range of clinical features, treatment, do's and don'ts related to mercury poisoning has been explained. The source of exposure and clinical manifestations are similar to the explanation seen in modern toxicology texts. The majority of drugs explained under treatment of mercury poisoning are possessing *sheetaveerya* (cold potency) and *vishahara* (anti poisonous) properties which are opposite to the action of *visha* (poison) and also having other potentials which can pacify the symptoms of mercury poisoning. Due to the presence of *raktadhatu* (blood) involvement, which is common to *vatarakta* (gout), *kushta* (skin disorders), *upadamsha* (chancre) and *visha* (poison), the same formulations, do's and don'ts of *vatarakta* (gout), *kushta* (skin disorders) and *upadamsha* (chancre) may be told to follow in *Parada vikaras* (mercury poisoning).

## CONCLUSION

*Paradavikara chikithsa*, a unique chapter has been dedicated for mercury poisoning in *Bhaishajya aratnavali*. It has a comprehensive explanation about importance of mercury, exposure source, clinical features, treatment, do's and don'ts of mercury poisoning. Along

with the formulations the author has placed more of an emphasis on easing the discomforts brought due to mercury exposure.


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