

CLASSICAL REVIEW OF *PARADA AJEERNA* I.E MERCURY TOXICITYDr. Ravindra Angadi<sup>1</sup> and Dr. Sangeeta Rao\*<sup>2</sup>

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## ABSTRACT

*Ayurveda* has used mineral and herbomineral substances in therapeutics since time immemorial. But with the recent questions raised regarding the safety of these formulations for containing considerable levels of heavy metals like lead, mercury &/ or arsenic etc, there is a need to scientifically evaluate & establish the safety of such preparations. A drug can be a nectar or poison. Classics of *Ayurveda* do mention the hazards of drugs which are not properly manufactured. Such mentions clearly show that they were fully aware of the hazards of these heavy metals. This article highlights the various methods told to be adopted to prevent any untoward complications and even if in any eventuality, side effects are noticed, the treatments have been mentioned.

**KEYWORDS:** *Parada ajeerna*, heavy metals, toxicity.

## INTRODUCTION

*Ayurveda* has used mineral and herbomineral substances in therapeutics since time immemorial. But with the recent questions raised regarding the safety of these formulations for containing considerable levels of heavy metals like lead, mercury &/ or arsenic etc, there is a need to scientifically evaluate & establish the safety of such preparations.

A drug can be a nectar or poison. Classics of *Ayurveda* do mention the hazards of drugs which are not properly manufactured. Such mentions clearly show that they were fully aware of the hazards of these heavy metals, thus they have also prescribed specific processing techniques like *shodana*, *marana*, *jarana* which will remove the hazardous properties of the drugs. They have prescribed testing methods for the final product like *Bhasma pariksha* and organoleptic characteristics which will tell whether it is safe to use therapeutically.

The *Rasoushadies* are to be administered orally in specific quantities with great caution along with requisite *anupana Anupana* not only take part in delivering the main drug to the target organ but also is anticipated to play a key role in safety aspects of *rasoushadhi*.

The administration of *Rasoushadies* with proper dosage and by following *pathya ahara and vihara* i.e

concurrent diet advice to avoid any ill effects is also necessary.

Even if in any eventuality some untoward effects are noticed because of not following the above regulations, the treatments for such conditions have also been prescribed.

## MATERIALS AND METHODS

Following are the various regulations to be followed by the patient during the consumption of *rasoushadies*.

a) *Kshetrikarana*

For the consumption of any *rasoushadhi* our body i.e *kshetra* is to be made fit for the same.

This is compared to the preparation of the soil before sowing of the seeds.<sup>[1]</sup>

According to various Acharyas these are the procedures to be followed-

1. Take a *virechana* in the morning and do *fasting* for the whole day. Next day take *laghu ahara* and *Parada sevana* from next day.
2. Initially *vamana* and *virechana* and after regaining of strength, daily morning *choorna* of *pippali, haritaki, shunti, saindhava, chitraka moola* with luke warm water has to be consumed to improve digestion.

- At night for one month *Abhraka bhasma+kanta lohambhasma+pippali,haritaki +madhu+navanita* .
- After *snehapana,abhyanga ,virechana* with *icchabhedi* and *vamana* with *vachadi rasa*,it is followed by *krimipatana* by *palasha bheej* +*vidanga+guda*.<sup>[2]</sup>

Later for minor ailments formulations like *shringaabra rasa* and *lakshmilasa rasa* are given with *pathya* like *shali rice and jangala mamsa rasa*.<sup>[3]</sup>

If *kshetrikarana* is not done the *rasa* will not get digested and will cause toxicity & leads to death.<sup>[4]</sup>

#### b) Dose /Matra of Parada Sevana

- Parada* which is done *jarana* with *abhraka satva, kantalooha,tamra* etc is given from 1 *gunja/ratti pramana* to be gradually increased to 1 *masha*.<sup>[5]</sup>
- The *rasabhasma* which is *jaarita* with  
*Hema -1 gunja (125 mg)*  
*Rajata -2 gunja (250 mg)*  
*Tamra -3 gunja (375 mg)*  
*Teekshna, abhraka, kanta - 1 masha (approximately 1 gm).* for *nara -1 valla pramana (2 ratti)*<sup>[6]</sup>  
*For asva -1 gadyana (32 ratti)*  
*For gaja -2 gadyana (64 ratti)*

Table showing the anupanas mentioned for Parada bhasma sevana for various diseases.<sup>[9]</sup>

Kasa, shwasa, shoola	Trikatu, bharangi, madhu
Rakta vikaras	Haridra+sharkara
Kamala,pandu	Trikatu, triphala, vasa
mutrakruccha	Shilajatu, ela+sitopala
dhatuvruddhi	Lavanga, kesara, suddha Hingula, pippali, vijaya, karpura, ahiphena
jwara	Souvarchala, lavanga, bhunimba, haritaki
atisara	Souvarchala, triphala, lavanga, kesara, suddha Hingula
chardi	Bhanga, ajmoda
pushti	Guduchi satwa
mandagni	Saindhava,ajmoda
Pitta rogas	Sharkara+amalaki
Vata rogas	Pippali
Kapha rogas	Shunti
Dhatu vrudhhi	Nagavalli,vidari

#### Treatment for improper use of Parada.<sup>[10]</sup>

Due to improper usage of Parada if it causes *rasaajirna* i.e toxic symptoms, its treatment is mentioned like-

- Udgara* –curd rice and *Krishna meena* with *jeeraka*
- Vata prakopa* – *abhyanga* with *narayana taila*
- Arati*-cold water should be applied over head
- Trushna*-coconut water, *mudga yusa +sarkara*.

**Avoid-** *draksha, dadima, kharjura, kadali, dadhi, ikshurasa, sitopachara*.<sup>[11]</sup>

#### Treatment for *rasaajirna*

- Souvarchala lavana +gomutra*.
- Matulunga+saindhava+shunti choorna*.
- If by mistake a person consumes *Parada* containing *naga and vanga dosha* then its treatment is

#### c) Pathya and Apathya

##### Pathya

- Mudga shali, dugdha, navanita, punarnava shaka, Dhanyaka jeeraka,patola meghanada, saindhava, pippali, musta, padmamula, godhuma, yava, jangala mamsa rasa*.
- Water exposed to sun during day time and to moonlight during night, that is *hamsodaka*.<sup>[7]</sup>

##### Apathya

- Kakarasthaka- kushmanda, karkoti, kalinga, karavellaka, kusumbika, kalambhi, kakamachi*.
- Abhyanga* with *katu taila*,
- kanji, sura, dadhi, dwidala, varthaka(brinjal), amlarasa, rasona, mulika(radish) kulatta, atasi, tila, masha, masura, sarshapa*.<sup>[8]</sup>
- Anga mardana, ratri jagarana, diwaswapna, katu, amla, tikta, lavana, madhura*, warm food, ice water.
- shoka, krodha, chinta, sahasa, maithuna*.

#### d) Anupana for Parada bhasma sevana

Anupana plays a major role in not only increasing the bioavailability of the main drug but also reducing the toxic effects of it.

*karavellaka, karkoti pathya, sharapunka+saindhava +gomutra*.

- For mercury toxicity, *suddha gandhaka* should be consumed as treatment.<sup>[12]</sup>
- If *rasayogas* like *Rasasindoora, Rasakarpoora* (calomel) has caused any complications then it can be treated by administering *Dhanyaka+sita, maricha+ghruta*.<sup>[13]</sup>

#### Parada jeerna or Paradapaka lakshanas.<sup>[14]</sup>

These are the symptoms which show that Parada has got completely digested & will not lead to toxicity like having feeling of wellbeing, proper urge for hunger & thirst & proper co-ordination of sense organs.

**Mercury poisoning****Fatal dose**

1-4 gm of mercuric chloride  
 10-60 mg/kg of methyl mercury  
 10 mg /m<sup>3</sup> of mercury vapours  
 Fatal period-3-5 days

**Mercury poisoning symptoms<sup>[15]</sup>**

- Muscle weakness, poor co-ordination, numbness in hands and feet, skin rashes, anxiety, memory problems, trouble during speaking, or trouble seeing, profuse sweating, tachycardia, increased salivation, hypertension.
- Affected children have red cheeks, nose, lips, loss of hair, teeth, nails, rashes, sensitivity to light.
- High exposure to methyl mercury is known as Minamata disease.

**Forms of mercury exposure**

It includes metal, vapour, salt, & organic compound. Exposure is from eating fish, amalgam based dental fillings, exposure at work. Except elemental liquid mercury all other forms produce toxicity or death with less than a gram.

- Compounds of mercury tend to be much more toxic than either the elemental or the salts. The most dangerous being dimethyl mercury. Methyl mercury & organo mercury compounds are particularly found in tuna fish or sword fish.
- Inorganic mercury compounds-Mercury occurs as salts such as mercuric chloride (HgCl<sub>2</sub>) & mercurous chloride (Hg<sub>2</sub>Cl<sub>2</sub>) or calomel. Because they are more soluble in water, mercuric salts are more acutely toxic than mercurous salts & hence they are readily absorbed in GI tract. They cannot cross blood brain barrier easily, hence neurological damage occurs only on chronic exposure. Mercuric cyanide is very toxic.
- Elemental mercury is poorly absorbed by oral intake & skin contact. Its vapour is hazardous. Less than 0.01% of ingested mercury is absorbed in GI tract.

**Limits**

In US-elemental mercury-0.1 mg/m<sup>3</sup>  
 Organic mercury-0.05mg/m<sup>3</sup>  
 Methyl mercury-1 ppm (1 mg/l)  
 Inorganic mercury-2 ppb (0.002 mg/l)

**Treatment for mercury poisoning**

**Chelation therapy.**<sup>[16]</sup> this therapy is used as antidotes for poisoning by mercury, arsenic, lead. These convert this metal ions into a biochemically inert form that can be excreted. The various chelators used are-  
 DMSA  
 DMPS (dimercapto propane sulfonic acid)  
 DPCN (D- penicilamine)  
 Dimercaprol (BAL)  
 ALA-alpha lipoic acid

**EDTA**

Chelation therapy can be more hazardous if administered incorrectly as it may lead to hypocalcemia causing cardiac arrest and death. Its side effects are dehydration, allergy, neuro developmental diseases, increased enzymes etc.

- Supportive care(ABC)-airway, breathe, circulation
- If exposure via skin –irrigation of exposed area.
- Aggressive hydration is required because mercury has corrosive action & hence one should not induce vomiting.
- Gastric lavage & protein containing solutions like milk, egg whites.

**DISCUSSION**

Mostly *kakarastha* drugs avoids absorption of *Parada* hence could be the reason to avoid during *parada sevana* and also forms the treatment for mercury toxicity.

If there is mercury poisoning symptoms one should use *atyanta amla*, *katu, tikta* because these foods decrease the potency of *Parada* that is becomes *mandaveerya*.

During *rasasevana* one should avoid one time meal as the person who consumes only one time meal his *agni* will become *manda* and due to this *Parada* will not be absorbed.

So the one who consumes splendid diet his *Parada* is properly absorbed and potency is also increased.

Milk products and egg whites are advised during mercury toxicity as they may bind gastric mucosa & limit its absorption.

**CONCLUSION**

Considering the above points we can conclude that by following the proper rules and regulations pathya, anupana proper dosage we can avoid mercury toxicity. The causation of various diseases could be due to intake of impure mercury present in soil, water & air, but by doing various *samskaras* on it, it converts into a nectar.

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