2.0 WATER TREATMENT IN AYURVEDA

Introduction

Water Is the Basis of Life, Whole World Is Covered With Water and Nothing Is Possible Without Water for Either the Healthy or for the Patient. Thus goes a verse from Astanga Sangraha (Murthy, 2002) which summarizes the importance of water. Life on earth is impossible without water. It is essential for all living beings for their survival and well being (Ball, 2005). Early civilizations started around the water sources. Water is not only important for drinking but also for transport, trade and agriculture (Nautiyal, 2009).

Role of water in Human body:

Water is an universal solvent for ions, required for cell signaling, enzyme activation, mineralization of organic compounds and properties. Water also plays a key role in digestion, removal of toxins and lubrication of cavities such as joints. It is also involved in epithelial transport, hormone release, cell proliferation, migration and cell death (Kavouras, 2010). Water shields cells and organism from temperature swings due its ability to absorb and lose heat without undergoing a large temperature change (Wertzmanet. et. al., 1980; Manz et.al., 2005).
Water in Ayurveda

‘Water’ is also discussed very well in several contexts in Ayurveda literature. Both codified and non-codified systems of knowledge related to Ayurveda have a deep understanding about the materials used in daily life. Water is considered to be ‘Jeeva’ (life) in ayurvedic concepts. It is Madhura (sweet), Sheetala (cold) and Ruchikaraka (tasty). It relieves Daha (thirst), Moha (loss of mental block), Bhrama (giddiness), Jeernakari (effectively digests food); it relieves Nidra (sleepy feeling), Alasya (lazyness), Visha (toxins), Truptikara (provides immense satisfaction to thirsty person), provides Buddhi (intelligence), Bala (strength), Veerya (potency: ability to function), Tushti (satisfaction), Pushti (energy) to Nashta anga (debilitated parts of the body). Water is wholesome as it has all the six tastes (Rasas). The six tastes are sweet (madhura), sour (amla), salty (lavana) pungent (katu), bitter (tikta) and astringent (kashaya) (Murthy, 2002; Chunekar, 2004).

Ayurveda identifies different types of water based on place of origin and availability. Quality of water flown in different rivers is also told to have different properties. Ayurveda indicates methods to identify impure water and suggests several techniques like use of herbs and metals like copper to enhance the quality of drinking water. Many of these techniques can be practiced even today. However, effective studies on water have not been
conducted as per Ayurvedic ontology and epistemology. This understanding is based on a unique philosophy and worldview of Ayurveda and Indian Systems of Medicine developed over centuries. If properly understood and used, such knowledge can be a tool to find answers for several health problems our society faces today.

**Methodology**

Information on methods of water purification available in different Ayurveda texts have been screened. The literature searched are from

a. *Brihattrayi*: they are the classical texts of Ayurveda about the basic concepts on material science, disease origin, pathology, diagnosis and treatment.

b. *Nighantus*: Lexicons, written after 10 Century AD. Detailed explanation of types of water, their properties, actions, possible impurities and treatment methods have been explained in these books.

c. *Chikitsagranthas*: The books written after 10th Century, they are source of information about various therapeutic roles of water and purification techniques of impure water.

d. *Interactions with Vaidyas (local healers)*

**Common Synonyms for water**
According to ayurvedic principle, water gives life (Jeevanashrayan) is wholesome for everyone (pathya). Water has many synonyms defining its properties and uses detailed in table 2.1. Most of these synonyms indicate the quality of water and its goodness for the consumers (Tripathi, 1982; Chunekar, 2004)

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Meaning in English</th>
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<tbody>
<tr>
<td>Paniya</td>
<td>Water intended to drink</td>
</tr>
<tr>
<td>Jeevana</td>
<td>Giving life</td>
</tr>
<tr>
<td>Nira</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>Amruta</td>
<td>Superior quality of liquid</td>
</tr>
<tr>
<td>Jala</td>
<td>Natural cold water</td>
</tr>
<tr>
<td>Aapa</td>
<td>Water</td>
</tr>
<tr>
<td>Ambha</td>
<td>Water from clouds</td>
</tr>
<tr>
<td>Paya/payasa</td>
<td>Water having qualities similar to milk</td>
</tr>
<tr>
<td>Ambu</td>
<td>Drops of water</td>
</tr>
<tr>
<td>Salila</td>
<td>Good, free flowing water</td>
</tr>
<tr>
<td>Payasa</td>
<td>Water nurturing like milk</td>
</tr>
<tr>
<td>Vanamruta</td>
<td>Spring</td>
</tr>
<tr>
<td>Pushkarambha</td>
<td>Water with lotus</td>
</tr>
<tr>
<td>Patha</td>
<td>Wholesome for everyone</td>
</tr>
<tr>
<td>Shambara Varunaka</td>
<td>Water from clouds</td>
</tr>
<tr>
<td>Kilaala</td>
<td>Heavenly drink</td>
</tr>
<tr>
<td>Vari</td>
<td>Free flowing water/fluid</td>
</tr>
<tr>
<td>Kamala</td>
<td>Water where lotus are grown</td>
</tr>
<tr>
<td>Bhuvana</td>
<td>Water</td>
</tr>
</tbody>
</table>

Table 2.1 Synonyms of water
Impurities in water

Various sources and types of contamination of water are detailed in the traditional texts. Impure water was known as ‘Kalusha’ water. Impure water, when consumed is known to aggravate any one or all the three *doshas* in the body. Contaminated water is water which is dirty, mixed with slush, algae, weeds and leaves, which is not exposed to sunlight and wind, which is a mixture of old and fresh water is thick, heavy and frothy, contains worms etc. (Murthy, 2002). Water could become impure if water is covered with lotus leaves, moss, grass etc which develops putrid smell. This is because they are not exposed to sun or moon rays and such water is said to be polluted. Water mixed with urine, faeces, *aruna visha* (type of poison), hot with strong smell or taste, frothy, unseasonal (*ritu viparita*), salty, is also described as contaminated or impure water (Dash, 1994)

Methods to identify impure water

Many methods, based on sensorial aspects were adopted to identify impure water.

- Presence of streaks, froth, bubbles, sharp odour
- Death of frogs and fish while coastal birds are intoxicated
- Shadows not appearing in water, representing the turbidity of water
- Shadows, if visible, appear in two’s, smaller or abnormal (Sharma, 2004)
Results of consuming contaminated water

According to Ayurvedic principles, contaminated water causes eruptions on the skin. Water collected from rain stream is contaminated and. It is Vishtambhakara (causes constipation), durjaram (may cause ingestion and abdominal upset) and may vitiate Vatadosha (Sastry, 2002)

Animals and humans, even bathing in such would suffer from vomiting, mental confusion, fever, burning sensation and inflammation. Water polluted by urine, faeces and semen etc causes oedema and ascites (Sharma, 2004). In rainy season, water is immature having mostly dirt on earth and produces vidaha (burning sensation), reduces appetite. Concept of epidemics was well known in the ancient times. Water available during season and natural calamities (floods, famines etc) causes various diseases or epidemic leading to death of people (Sharma, 2004).

Water Purification Methods

There are many methods of water treatment in Ayurveda. These are generally non-specific as in the present day context wherein it is removal of harmful chemicals or pathogenic microorganisms in water. The traditional methods emphasized on physiological (curative, health promoting) benefits. However, the relevance of these methods as per the western biomedicine is not really understood and no effort has been made to understand the relevance of
these methods and recommendations. The methods of water treatment included boiling, exposure to sun rays, moonlight, using herbs, stones, metals and minerals.

1. **Hamsodaka** (water which is exposed to sunrays during the day time and to the moon's rays at night) is the ‘best’ quality water. It is *Rasayana* (rejuvenating), *Balya* (strength promoting), *Medhya* (intellect promoting), alleviates three *doshas*[^1], *anabhishyandi* (which does not obstruct channels of circulation) (Chunekar, 2004)

[^1]: *Doshas literally means ‘that which has become vitiated’. The understanding of functioning of human body in Ayurveda is based on tri-doshas. The tri-doshas are vata, pitta and kapha. These words in Sanskrit refer to functions like movement, transformation, support and growth respectively. Vata represents dryness, lightness, weightlessness, coldness, roughness, minuteness and movement. Pitta refers to parameters like slight unctuousness, penetrating, heat producing, lightness, bad smell, causing movement and liquidity. Kapha indicates unctuousness, producing coldness, heavy, sluggish, smoothness, shining, firm/static (Jayasundar, 2010).

2. **Boiling**

Many references in the texts on boiling water (*Shrutashita jala*) indicate the ancient people understood the relevance and importance of boiling water.
Ayurveda offers many beneficial/therapeutic effects of boiled water. Boiled water is known to be ‘Wholesome’ water and is ‘Tridosha nashaka’ (pacifies Tridosha). Water which is boiled was known to be free from ‘foam’ and ‘movement’ and clean. It is supposed to be ‘Light’, a digestive stimulant (deepana), carminative (pachana), and helps in alleviating Vata and Kapha Doshas. Hot water cures parshvaruka (pain in sides of the chest), rhinitis (pinasa), flatulence (adhmana) and hiccup (hikka), cleans bladder (basti). The time-period for boiling water is also elaborately mentioned (Chunekar, 2004).

Water boiled for different duration was recommended to have different benefits. Water reduced to ¾th after boiling alleviates Vatadosha. Water reduced to half after boiling alleviates pitta and vatadosha disease conditions. Such water is useful in Hemanta (early winter), shishira (late winter), Varsha (rainy season) and Vasantha (spring season) (Dash, 1994; Sastry, 2002). Water boiled to half its original volume relieves Kapha, meda (fat), vata, improves jatharagni (appetite), cleans up urinary tract, and is also useful in Kasa, Shwas, Jwara, and quenches thirst. This water is recommended to be administered in Navajvara (fever), Pratishyaya (cold), Parshvashhula (pain over sides), galagraha (throat problems), after taking purgative, adhmana (flatulence), vatakapha related problems, Aruchi (anorexia), grahani (colitis), gulma, shwas (dyspnoea), kasa (cough), vidradhi (abscess), hikka (hiccup) and after snehapana (oleation). Water must be boiled to half in Shishira (late winter), Vasanta (spring) and in Grishma (summer season) (Dash, 1994; Sastry, 2002). Water reduced to one fourth
after boiling is light, stimulates power of digestion, constipative, and alleviates *Kapha*. It is useful in summer, autumn and early winter (*Hemant rutu*). It helps in digestion, *Deepana* (stimulates appetite), it is *Laghu* (light) and useful in different types of fever).

If hot water is taken at night, it clears the adhesion of *Kapha*, helps in elimination of *Vatadosha* and helps to relieve indigestion (Dash, 1994; Sastry, 2002).

**3. Exposure to sunrays or hot piece of iron**

Boiled water is recommended to be exposed to sunrays or hot piece of iron. *Suryamani* (a precious stone), sand pebbles are also recommended to be immersed.

**4. Impregnation with herbs**

Herbs such as *Karpura* (exudate of *Cinnamomum camphora*), *Guggulu* (exudate of *Commiphora wightii*), *Punnaga* (*Calophyllum inophyllum*), *Patala* (*Stereospermum suaveolens* DC.). This cleaned water is cooled by adding *Kanaka* (gold), *mukta* (pearl) etc. Drinking this processed water would never aggravate the *Doshas* (Dash, 1994). Water boiled with *Sunthi* (dry ginger: *Zingiber officinale*) was beneficial for *Kaphaja Roga* (diseases originated by *Kapha Dosha*) (Sastry, 2002), and if boiled with *Ajwain* (*Trachyspermum Roxburghianum* - Indian celery) was recommended for *Vata Roga*. Ash of herbs was also recommended to be added to water. Ash of herbs such as
Dhava (Anogeissus latifolia WALL.), Ashvakarna (Dipterocarpus alatus ROXB.), Asana (Pterocarpus marsupium ROXB.), Paribhadra (Erythrina variegata), Siddharthaka (Brassica alba L.), Mokshaka (Schrebera swietenioides ROXB.), Aragvadha (Cassia Fistula), Somavalka (Acacia leucophloea (ROXB.), Katphala (Myrica nagi Thumb.) were recommended to be added about one anjali (160 g) to the pitcher containing water.

5. Use of metals, minerals

Water is recommended to be stored in containers made of Suvarna (Gold), Rajatha (silver), Tamra (copper), Kamsya (bronze), Mani (crystals/precious stones) or earthen vessel.

Copper utensils to store and to serve water

Water stored in copper containers for overnight and consumed the next day is believed to impart ‘health benefits’. Well-boiled and then well-cooled drinkable water should be given in copper vessel (Sharma, 2004). However, cooked milk is not recommended to be kept in copper vessels before serving it (Murthy, 2002).

Copper is called Tamra in Sanskrit. More than 75 synonyms of Tamra are described in classical texts: Some of them are –

- Anuvindam : Got after extraction
Ambakam: Red in colour
Aravindam: Red like sun
Arkam: Auspicious
Udumbaram: Resembles Udumbara Phala
Audumbaram: Resembles Udumbara Phala
Kaniyasam: Available in the form of minute particles
Kamalahvayam: Like colour of lotus
Ushmam: Causes heat in the body
Ushmakaram: Causes heat in the body
Trilochanam, Triyambakam: Obtained from the three sources water, wind and fire.
Nagasya Mardanam: Destroys the Naga Visha
Nepaliyam, Nepalakam: Available in Nepala Desha
Raktadhatu, Raktaloham: By its red colour
Ravipriyam, Suryaloham, Suryakyam, Suryagam, Suryestam: Related to Surya
Mleccham, Mlecchamukam: Colour of Surya (Sun)

To make Tamra (copper) utensils, it is recommended to be detoxified and calcinated (Tamrashodhana). Thin sheets of Tamra are dipped in cow's urine and kept for three hours (Borker, 1996).

According the Ayurvedic principles, copper produces a scrapping effect (Lekhana), heals and nourishes when administered in a small dose. It is
astringent, sweet, bitter and sour and mitigates Pitta and Kapha. Its Vipaka (post - digestive property) is pungent with a cold potency. It is recommended to be used in treatment of Pandu (anaemic disorders). Copper may have also play a role in physiological enhancement of water quality. Copper is also recommended to be used in conditions of Udara (ascitis), Arsa (piles), Kustha (skin disorders), cough, Svasa (dyspnoea), Kshaya (pulmonary tuberculosis), Pinasa (coryza), Amlapitta, Sopha (edema), Krimi (worm infestation) and Sula (pain) (Sharma 2004).

Tamra bhasma (ash) are used for many indications in ayurveda. Tamra is used in diseases like tumors (Gulma), Skin disorders (Kusta), piles (Guda vikara), pain (Shoola), swelling (Shota), ascitis (Udara roga), aneamia (Pandu), dysentery (Virechana) and vertigo (Bhrama).

Water treatment in Local Health Traditions

Herbs such as tulsi (Ocimum sanctum), Jeera (Cuminum cyminum), Pattanga (Cesalpinia sapan), Vetiver (Vetiveria zizanioides) are routinely added to drinking water to enhance their physiological property as a local health tradition. Many of these traditions are practiced in southern states of Kerala, Tamil Nadu and Karnataka. Addition of Jeera is believed to balance Vata Dosha and therefore relieves mild pains, whereas Vetiver balances Pitta Dosha, and relieves burning sensation of body. Addition of ginger reduces Kapha Dosha and is helpful in common cold, cough etc. Hemedesmus indicus (Indian
Sarasaparilla, anantamul) and Emblica officinalis (amla) is recommended to be soaked in water. The sweet taste imparted to water is believed to induce the strength of ‘vital’ fluid (blood). Vessels such as brass and copper are also recommended for storage of drinking water (personal communications with Vaithiyar K.P. Arjunan).

Conclusion

The importance of water for survival of life is undisputed. Many methods, techniques and recommendations for water treatment, purification and quality are given importance in the classical Ayurvedic texts. Many of these methods are significant even today. For example, the use of sunrays for water purification is now practiced widely in many developing countries of Asia and Africa for water purification.

Classical texts also include aspects of quality control of water. These included the source of origin, the place of collection, season and various sensorial parameters like colour, taste and smell. Hippocrates, the father of modern medicine also mentions the importance on water quality similar to those mentioned in the Ayurvedic texts (Paraskeva, 1995). The present compiled work on use of copper for microbial water purification also substantiates the ancient recommendation of storing drinking water in copper containers. However, there are many recommendations that need to be understood. The health benefits of these recommendations can tried to be understood using
modern scientific tools and techniques, although many of the recommendations are not clear so as to elucidate them logically or according to the present day tests and techniques available. The promotion of these simple recommendations would contribute to wellness and public health.