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AYURVEDA CONCEPT OF ASEPSIS AND ANTISEPSIS W.S.R. TO STERILIZATION (*NIRJIVANUKARAN*)

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Abstract

The term "sterilization" referred to as "*Nirjivanukaran*" in Ayurveda which means elimination of microorganisms and any infectious agents. Ayurveda *Acharyas* also emphasized the importance of *Nirjivanukaran* before and after surgical procedure to prevent consequences of infections. In this regard Ayurveda suggested various methods including *Vrana Prakshalna, Dhupana Karama* and *Shastra Tapan,* alongwith sterilization of *Kumaragara* and *Sootikagaara*.

Sterilization (*Nirjivanukaran*) is considered crucial for infection control to enhance the success of surgical and para-surgical interventions. Air fumigation, physical and chemical methods, water filtration, uses of heat and sterilization through vapor, etc. are common methods of *Nirjivanukaran*. This article summarizes Ayurveda concept of asepsis W.S.R. to sterilization (*Nirjivanukaran*).

Key-Words: *Ayurveda, Shalyatantra, Nirjivanukaran, Sterilization, Asepsis*

Introduction

Sterilization means liberating from all microorganisms by eliminating them from particular area or neutralizing their effects. Ayurveda described these all approaches under the categories of *Raksha karma*. Ayurveda surgeon often encounters challenge of infections arising from instruments and operating theaters, etc. To prevent these all-problems chemical and physical sterilization methods are recommended before and after surgery [1-4].

The ancient *Acharyas* employed *Agni*, *Kwath*, sunlight and fumigation approaches to safeguard against different organisms. Some important approaches of sterilization used in Ayurveda are depicted in **Figure 1**. The hazardous organisms can become perilous in operating theaters, open wounds, neonatal units, labor rooms and patient wards, etc. Their entry into the body can lead to diseases and secondary infections that may delay the recovery of surgical process. Therefore, the implementation of proper disinfection, aseptic precautions and sterilization becomes crucial to address and prevent such potential consequences [4-6].

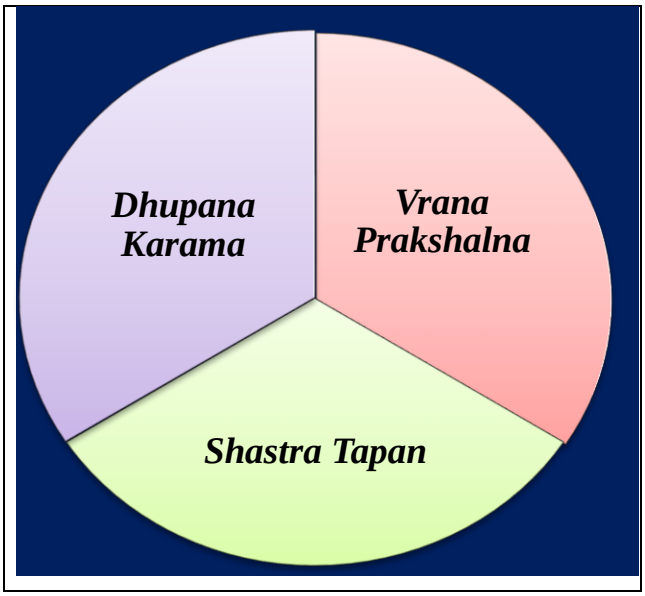

Figure 1: Various approaches of sterilization in Ayurveda

Cleaning of the *Vaidya*, *Atur* and *Vranitagar* are prime approach of sterilization along with other physical and chemical methods. The improper cleaning or sterilization may leads sepsis which is defined as a condition resulting from the presence of harmful

microorganisms. Sepsis could lead to multiple organ failure and severe infections that affect process of recovery. Antisepsis is defined as the prevention of growth of disease-causing microorganisms. Asepsis is defined as the exclusion of bacteria and other microorganisms, typically during surgery. Similarly the term "sterilization" means removal or killing of microorganisms to preventing secondary infections. In Ayurveda *Vrana Prakshalna, Shastra Tapan* and *Dhupana Karama,* etc. is mainly employed for the purpose of *Nirjivanukaran*. These all approaches play important role to ensure safety and efficacy of surgical interventions [6-8].

The drugs like *Daruharidra, Haridra, Ghrita, Tila, Mulethi, Saindhava, Nimba* and *Trivrta* are considered good for their *Shodhana* and *Ropana* properties. Thus employed for the purpose of disinfection by various means.

Similarly bandaging is considered crucial for protecting wounds from environmental conditions, foreign bodies and other things that can causes infection on open wound.

Acharyas also used fumigation with *Dhoopna Dravyas* to disinfect area or instruments. In modern sterilization techniques, autoclaves are commonly used for sterilizing cotton, gauze pieces and bandages [5-7].

Sterilization Methods:

1. Heating by dry and moist heat
2. Radiations
3. Drying in sunlight
4. Ultrasonic Vibrations
5. Fumigation
6. Chemical sterilization and filtration

Physical methods encompass dry heat and moist heat. Autoclaving, the most prevalent method for surgical sterilization, utilizes steam under pressure. During this process, water boils, and its vapor pressure aligns with the surrounding atmosphere. The heightened pressure within a sealed vessel raises the temperature of water, allowing saturated steam with superior penetrating power. This method is commonly employed for

sterilizing surgical instruments such as needles, syringes, suture materials, swabs, dressing materials, gloves and gowns, etc.

Chemical methods involve gas sterilization using substances like formaldehyde, betapropiolactone and ethylene oxide, etc. These gases are applied to fumigate operating theaters, wards, blankets, pillows and other cloths of Operation Theater.

Mechanical methods employ filtration for sterilization. Microorganisms are physically eliminated through absorption on the filter medium or mechanical mechanisms. The operation theater sterilization process comprises four zones: outer zone, restricted zone or clean zone, aseptic zone, and disposal zone. Various methods and machines, including fumigation, ultraviolet rays, and radiation, are employed for surgical area sterilization to ensure it free from infections [7-9].

Sterilization using heat achieved through conduction, dry heat destroys microorganisms by coagulating their proteins. Bunsen burner, hot air oven and muffle incineration, etc. are mainly used for this purpose. Infrared radiation, microwave and electric cautery also employed along with the direct contact of heat or heating object.

Air purification involves various *Dhupana karmas* using *Laksha, Ativisha, Haritaki, Kustha, Haridra, Valaka, Guggula*, *Agaru*, *Nimba*, *Mustak* and *Ela,* etc. These substances possess antimicrobial properties thus helps to disinfect particular area.

Hamsodaka mentioned for water purification, water purified by the rays of the sun, similarly *Marjana* and *Prasadana* suggested for water purification by *Sushruta.* Medicinal substances like *Bisa Granthi, Kataka*, *Mukta, Chandrakanta Saibal Moola, Gomedaka* and *Mani,* etc. are also utilized for water purification [8-10]. The water purification involves following approaches based on the involvement of contamination:

- Boiling is recommended for highly polluted water.
- Exposure to sunlight for water with lower pollution.
- Addition of a red-hot iron ball or sand for moderately polluted water.

Sterilization of *Kumaragara, Vranita gara* and *Sutika gara* involves following consideration:

- ✓ These spaces should lack direct light or air but maintain proper ventilation
- ✓ Area should be free from the dust and smoke.
- ✓ *Dhupan Yogas* like *Mimba, Sarshap, Lavana* and *Ghrita* are used to fumigate the room.
- ✓ Fumigation of clothes and rooms should be performed with *Nimba*, *Guggula* and *Akshata*.
- ✓ *Vranabandhan dravyas* used for wound dressing to prevent secondary infections.
- ✓ Honey, horns of sheep and body hair of goats, etc, are employed to purify wounds from harmful substances.

Conclusion

Ayurveda encompasses various therapeutic branches and *Shalyatantra*, involving surgical and parasurgical interventions, is one of them. To ensure the success of surgical treatments, *Acharya* recommends *Raksha Karma*, which is the equivalent term for sterilization. *Acharyas* have outlined various *Dhoopana* methods with *Rakshoghna dravyas* for sterilizing operation theaters, surgical wards and instruments, etc. These approaches help in protection against microorganisms. Instrument sterilization is achieved through methods like *Agni*, *Kahaya* and *Atapa*, etc. Today's sterilization procedures adhere to these same fundamental principles of Ayurveda, utilizing heat, chemicals, or radiation. In Ayurveda, various methods such as *Dhupan*, *Prakshalana* and *Agni tapan,* etc. are also employed for the sterilization of instruments and surgery rooms.

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