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IMPORTANCE OF DHŪPANA KARMA- NIRJANTUKARANA / STERILIZATION: METHODS, TYPES AND ITS ROLE IN SURGICAL PRACTICE.

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ABSTRACT-

Nirjantukaraṇa is a term to denoting the meaning of sterilization.

For a successful surgery, sterilization is essential. These methods were mentioned sporadically in classical texts under various surgical procedures.

Āchārya Ḍalhana mentioned the physical method of sterilization of instruments before an operation by flaming them. Further, he explained that if this method is not done, the operation site becomes prone for infection.

Dhūpana karma (fumigation), characterized under Bahirparimarjana, has been mentioned as a treatment in all classics of Ayurveda. This medicated smoke creates an aseptic environment which kills the microbes thus preventing infections.

KEYWORDS- *Bahirparimarjana, Dhūpana karma, aseptic environment, sterilization*

INTRODUCTION-

Dhoopana Chikitsa is performed in many diseases for disinfection of various diseases like *Vrana, Karnarog, Yoniroga*. It is also performed in houses for disinfection of rooms. *Dhoopana* is one of the measures mentioned for the maintenance of internal and external environment of man. Since Vedic period Home *Havana* and *Yagnya*, Sterilization of air by *Agnihotra*, Sterilization of house and place around it by *Dhoopana* is going traditionally.[1]

In *Dhoopana* karma utilizes natural substances so, it is absolutely safe for environment as

well as human being. Medicinal substances or mixture of medicinal substances which is burnt in a specific way to make smoke called as *Dhoop*.[2] Mostly *Agni* and *Vayu Mahabhoot* Pradhan *Dravyas* are used for this procedure. These are *laghu, Sheeta, Ruksha* and *Vishad* in nature. These qualities of the *Dravyas* help in its rapid spread ability and quicker combustion. There are three types of *Dhoopa* are explained namely: *Dhoop, Anudhoop and Pratidhoopa*. The source of origin of *Dhoop* is *Sthavar and Jangham* [3]. In Kashyap Samhita 40 *Dhoopana Yoga* (preparations) are explained. Fumigation is the exposure till the action of smoke or of fumes of any as a means of disinfection or eradication. *Dhoopana* has been explained for curative purpose. Fumigation is explained to prevent infection and for sterilization purpose [4]. In *Brihatrayi* there are many *Dhoopana* formulation are explained to disinfect cloths, beds, rooms to remove toxins and for sterilization of room and for air purification. This review includes *Dhoopana* formulation of various *Dhoops* to remove external toxins from air, for purification of air, which are divided into *Grahaghna Dhoopa, Rakshoghna dhoopa, and Dhoops* which are used to eliminate *Vishto* toxins are described in tabular form in this text.

Examples of commonly used Dhūpana Dravya: [4]

Nimba: Insecticidal, its fumes act against streptococcus pyogens after 10 minutes of exposure.

Guggulu: Potential action on gram +ve and -ve bacteria.

Sarshapa: Glycosinolates, biocidal action on bacteria and fungi.

Ela: Its volatile oil having antimicrobial and antifungal action.

Haridra: Exhibit fumigation activity against beetles and insects with antibacterial and antifungal activity.

Jatamamsi: Antibacterial due to essential oils.

Tulsi: There is presence of chavicol, eugenol, linalool, camphor etc. which acts as insecticidal, nematocidal, and fungicidal.

Āchārya Sushruta described the Rakṣoghna Dhūpa containing Sarṣapa, Nimba patra, etc. which has been told to use for wound management.

Disinfecting powder and ointments:[5]

Kushthaghna, Kandughna, Krimighna, Vishaghna etc. Mahakashayas. (Charaka) Arkadi, Eladi, Patoladi, Aaragwadhadi ganas (Sushruta)

Dhataki + Lodhra churna

Panchavalkal churna + shukti churna

Sikta taila

MODERN ASPECT-STERILIZATION

Definition:

A process designed to remove or destroy all viable forms of microbial life, including bacterial spores, to achieve an acceptable sterility assurance level.

Sterilization: If physical methods are used

Disinfection: If chemical methods are used

Definitions of terms related to sterilization:

Sepsis: The putrefactive destruction of tissue by disease causing bacteria or their toxins.

Asepsis: The complete absence of bacteria, fungi, virus or other micro-organisms that could cause disease.

Antisepsis: Elimination of bacteria, fungi, virus, or other micro-organisms that cause disease by use of physical or chemical method.

Process:

Bactericidal (Killing the bacteria)

Bacteriostatic (Limiting bacterial growth)

Disinfection: The process of killing pathogenic organisms from inanimate objects like surgical instruments.

Antiseptic agents: It is a chemical which either kills pathogenic organisms or inhibits their growth.

Antiseptic solutions:

Lysol	Hydrogen	Formalin
Savlon	Peroxide	solution
Phenol	Spirit	Povidone
		Iodine
		Silver nitrate

Method of Sterilization: [6]

1. Physical 2. Chemical

1. Physical method

1.1 Heat 1.2 Radiation 1.3 Filtration

1.1**Heat method:**

Dry heat	**Moist heat**
Flaming Hot air oven	Heating below 100°c Heating at 100°c (Boiling) Heating at 120°c (Autoclave)

A. Flaming:

Used in sterilization of inoculating lops or wires, forceps points & spatulas etc.

B. Hot air oven:

It is an electrical device used for sterilization utilizing dry heat.

Temperature: 160°c

Time: 1hour

Sterilization: Glassware, Forceps, Scissors, Scalpel, Syringes, Swabs, Dressings etc.

Heating below 100°c:

Used for pasteurization of milk (on 72°c for 30 seconds)

Heating at 100°c:

Immersion in boiling water (100°c) for 10 minutes kills most of pathogenic organisms. Used for sterilization of syringes, injection needles, surgical instruments except scissors, knives, suture needles etc.

Autoclaving:

A sterilizer that utilizes saturated steam under pressure.

Principle: In an autoclave, water boils when its vapours pressure equals the pressure of surrounding atmosphere. When water is boiled at increased pressure inside a closed vessel, the boiling point of water increases & so is the temperature of steam produced. Saturated steam has better penetrating power. When steam comes in contact with cooler surface, it condenses into water & gives up its latent heat to that surface leading to sterilization.

Temperature: 120°c

Pressure: 20 pounds per square inch

Time: 20 minutes

Sterilization: Syringes, needles, linen including gowns, masks etc.

Radiation:

Non ionizing

Ionizing

Non ionizing:

Infrared: Sterilization of syringes

Ultraviolet: Entryways, hospital wards, OT room etc.

Ionizing: It involves X-rays, Gamma rays & Cosmic rays.

Gamma rays: Plastic syringes, swabs, catheters, sutures, IV infusion set, blood donor transfusion set, scalp vein set etc.

1.3 Filtration:

Filtration through several different types of filters including the modern membrane filters (Millipore filters) is an efficient way of removing larger particles & bacteria from liquids (ex. Human serum albumin) that cannot be treated by other mean.

2. Chemical methods:

The chemical substance known as disinfectants, are antimicrobial agents that are applied to objects to destroy or inactivate pathogenic organisms.

Principle:

A chemical disinfectant acts by coagulating or changing the composition of protein, so that the latter no longer exists in the same form.

Examples:

Gases: Formaldehyde, Ethelene oxide etc.

Aldehydes: Formaldehyde

Alcohol: Ethyl alcohol

Dyes: Flavin, Acriflavines

Halogens: Chlorine & Iodine

Surface active: Soaps & Detergents etc.

DISCUSSION-

There are millions of micro-organisms around us. For the reduction of these microbial loads, the traditional fumigation technique like Dhoopan, Homa, and Havana is explained in Ayurveda in ancient times. In Kashyap Samhita, one entire chapter has been dedicated to this subject that is “Dhoop Kalpa”. These Dhoop kalpas are widely used in Ayurvedic Pharmaceutic Preparation and many Ayurvedic treatments for various reasons [7]

Mode of Action

Most of the *Dhoopana Dravyas* have an inevitable source of combustible ingredient as activator for the formulation. In *Dhoopana karma Agni & Vayu Mahabhoot* Pradhan *Dravyas* are used which are *laghu, Sheet, Ruksha & Vishad* in nature. So, it helps in rapid spread ability & Combustion. The formulation of *Dhoopana Yoga* contains drugs which shows a synergetic effect. It also helps in propagating activity of main antimicrobial drugs.[8] It includes ease of drug administration higher bioavailability & higher potential the blood brain barrier. It dilates blood vessels & help in oxidation of blood. It leads to adequate tissue perfusion & oxygenation. Thus, reduce inflammation, Itching, and eliminate infection.[9]

PRESENT NEED FOR DHOOPANA [10,11]:

- Antimicrobial resistance is one of the biggest health challenges facing humanity that must be tackled with all seriousness.
- 37% of house hold dusts are contributing by these microorganisms
- Chemical liquids and vapours used for the purpose of fumigation have their merits and demerits.
- Safety and efficacy concern have highlighted the need for alternative methods.
- Fumigation is used to inactivate biological material that may be capable of causing diseases.
- The disadvantages of chemical disinfectants include development of drug resistance, toxicity and hypersensitivity reactions.
- Hence *Dhoopana* today can play a major role as a disinfectant as it is eco-friendly and relatively cheaper.

CONCLUSION-

Dhoopan chikitsa is exiting since ancient time. It is not only used for disinfecting or purifying the atmosphere but also is used for treating the various infectious and contagious diseases. Dhoopan is said to be extremely effective not only for preventing but also in curative aspect. *Dhoopana* is an inseparable part of therapeutics in *Ayurveda*. *Dhoopana* which are mentioned in *Ayurveda* text play much more important role in Disinfectant, Insect repellent, as a room purifier and air freshener. *Dhoopana Karma* is effective in various disorders like *Karnaroga, Yoniroga* and also to prevent an infection from air. The drugs which are used in *Dhoopana* Yoga are easily available So, it is easy to do *Dhoopana* karma

in home also, for disinfection. In *Ayurveda* text there are many *Dhoop* formulations are mentioned.

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