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Review of Impact of *Dooshi Visha* on Female Infertility

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ABSTRACT:

Dooshi visha is a unique concept mentioned in *Ayurveda*, which has the potential to accumulate in various bodily tissues depending on their affinity and harm the body, by causing chronic illness. Present day exposure to various harmful chemicals can be considered as *dooshi visha* as they get accumulated in bodily tissues leading to cumulative toxicity causing chronic illnesses, instead of causing death immediately. Chemicals acting over the female reproductive system at different doses of exposure, and concept of *dooshi visha* was studied thoroughly. Chemicals having their affinity towards female reproductive system was found to cause significant harmful effects like infertility when exposed above permissible limit for longer durations, hence it can be considered as *dooshi vishas.* Incidences of chemical exposure and female infertility is increasing proportionally. Present day female reproductive problems viewed in the perspective of *dooshi visha* and treating accordingly may subside the present days female reproductive problems. Hence, present paper focuses on impact of *dooshi visha* on female fertility.

Key words: *Dooshi visha, Cumulative toxicity, Infertility, Chemicals*

INTRODUCTION

According to WHO, one among 4 couples in developing countries are affected by infertility. In a survey study 8-10% of couples worldwide of 60-80 million couples are suffering from infertility, among them 15-20 million (25%) are in INDIA.[1] Many of the toxin containing chemicals are still in abundant use in developing countries like India which are banned in developed countries, constant exposure to these chemicals accumulates in the body causing cumulative toxicity and endocrine disruptions,[2] which may be the cause of infertility. This concept is explained in *Ayurveda* in the context of *dooshi visha*. Table:1 shows List of chemicals, its toxic levels and its ill effects over female reproductive system.[3-29]

MATERIALS AND METHODS

Review of *Ayurvedic* Literature and their corresponding commentaries have undergone in-depth. Peer-reviewed medical publications and textbooks of contemporary medical sciences have also been cited as sources for this topic.

Ancient literature

According to *Acharya sushrutha*, any poisonous substance originated from plant, animal, or artificially synthesized

when enters into the body causes death to the person immediately due to the presence of all ten properties of poison. When these poisonous substances are kept years together or when these come in contact with medicines which has the property to nullify the poisonous properties or when it gets dried up with the influence of fire, wind, or sunlight, naturally it loses some of its poisonous properties or overall potency of the poison is reduced, by which these poisons become *dooshitha* hence called as *dooshi visha*. These poisons will not be able to cause immediate death, as it gets covered by *kapha* and stays in the body for longer time causing chronic illnesses at the presence of favorable conditions, these chemicals can lodge into any *dhathu* and cause vitiation of it depending on its affinity towards the organ[30]. Chemicals exposed on our day to day activities are not causing death of a person, but it is getting accumulated in our body and are causing chronic systemic illnesses. Hence these can be considered as *dooshi vishas*.

According to *Acharya sushrutha*, when the person gets exposed to *dooshitha desha* i.e., the place where there is increased breeze, cold or rain, *dooshitha kala* i.e., duration with increased cold, breeze, and heavy moist winds, or *dooshitha anna* i.e., alcoholic preparations, consumption of til seeds, horse gram, etc., habits like day sleep, sexual indulgence, exercises, anger and other avoidable emotional entities these factors when adopted frequently supports *dooshi visha* to cause vitiation of *dhathus*[31].According to *Acharya vagbhata*, wind blowing from eastern direction, indigestion, cold and cloudy environment, day sleep, or food which is incompatible to the body are also the factors supporting *dooshi vishas* to manifest illness .*Dooshi visha* has the ability to lodge into any *dhathus* depending on their affinity and cause chronic illness by vitiating those *dhathus,*[32] Initially *rasa dhathu* is afflicted, which is responsible for proper nourishment of body tissues and for nourishment of *raktha dhathu*. *Artava* also called as *stri raja* is formed by *rasa dhathu*,[33]For the formation of a fetus there is need of fusion of *shudha shukra* (sperm) and *shudha arthava*. Well-formed pure *rasa dhathu* is necessary to form *shudha arthava*. When *dooshi visha* lodges in *rasa dhathu* it fails to produce *shudha arthava,*[34]. Hence formation of healthy zygote is not possible.

According to *Acharya Sharangadhara arthava* is formed by *shonitha,*[35]. Hence, in some context *arthava* is also mentioned as *shonitha*. By this we can consider for the formation of proper *arthava* both rasa and raktha dhathu should be properly formed. According to *Acharya charaka* and *Acharya sushrutha* union of *shukra* and *shonitha* are important factors to form a zygote,[36,37] *Dooshi visha* effects *shonitha* and causes *shonitha dushti*,[38] by which implantation of zygote in the *garbhashaya* (endometrial layer of the womb) and formation of a healthy fetus is difficult. As mentioned by *Acharya charaka* union of *jeeva* is also important for giving life to a fetus. As mentioned by *Acharya sushrutha shonitha* is responsible for introducing and maintain *jeeva* in all organisms,[39]for which function of *shonitha* should not be hampered, Once *dooshi visha* effects *shukra dhathu*, it causes vitiation of *shukra dhathu*. *Acharaya Charaka* has mentioned due to vitiated *shukra* dhathu the zygote which is formed will not be properly implanted in the uterus, leading to spontaneous abortions or if implanted also gives birth to deformed fetus[40].

DISCUSSION

As above mentioned chemicals when exposed to an extent greater than their permissible limits causes chronic illnesses of reproductive system which shows their affinity towards the reproductive system. In minimum doses they get absorbed into the body causing cumulative toxicity after a longer period, when there is favorable conditions for its action. Treatment to the illnesses caused by these chemicals should be initially aimed at removal of accumulated chemicals. In our classics these accumulated chemicals are considered as *dooshi visha* and its line of treatment is mentioned as *swedana* (sudation), which brings the *dooshi vishas* located in the *shaka* (periphery of the body) to *kosta* (alimentary canal), by sudation the toxins present in the bodily tissue gets liquefied and comes to the alimentary canal. Later this is removed out of the body through *urdwa marga* (emesis therapy) or *adho marga* (purgation therapy). Finally traces of remnant *dooshi vishas* in the body is removed by administration of internal medication called *Dooshivishari agada* with honey,[41]. As the treatment modalities mentioned for *dooshi visha* is very apt to remove these chemicals lodged in our body tissues chemicals causing ill effect can be correlated to *dooshi visha* mentioned in our classics.

CONCLUSION

Harmful chemicals effecting the female reproductive system can be considered as *dooshi visha.* Present day female infertility problems can be viewed through *dooshi visha* perspective and can be treated accordingly. Which may give better outcomes for many of the diseases pertaining to female reproductive system. As exposure to harmful chemicals are increasing day by day, there is a

great need to explore and utilize the concept of *dooshi visha* and its treatment in more scientific manner.

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Table:1

List of chemicals, its toxic levels and its ill effects over female reproductive system.

S No.	Products	CHEMICALS	TYPE OF AGENT	TOXIC LEVELS	ILL EFFECTS
1.	Coffee Tea,[3] Green tea,[5], Medications.	Caffeine is a methyl xanthine alkaloid,[4] Green tea,[5]	Metabolic and CNS stimulant,[4]	Caffeine intake of more than 50 mg/day is linked to lower pregnancy rates in IVF patients,[6] More than 7g of caffeine per month (the approximate equivalent of more than two cups of coffee or four cans of cola per day),[3] more than 2 cups of green tea a day,[5]	Endometriosis, causes tubal defects, tubal infertility, ectopic pregnancies and spontaneous abortions, stillbirths and infant mortality.[3] impair development and reproduction, atrophy of reproductive organs.[5]
2.	Cigarette smoking, [6].	Tobacco, benzene, acetone,[6] nicotine Is present in tobacco,[7]	Tobacco, 300 polycyclic aromatic hydrocarbons, 43 carcinogens	Tobacco content is 1.23 +/- 0.15 % in domestic cigarettes. 7.17 – 12.65mg (1.80+/- 0.25 % tobacco) in each imported cigarettes. Passive smoking also increases risk of infertility,[8]	Reduce fertility in females, lowers mean numbers of retrieved oocytes, infertility, pregnancy loss, IVF failure, including maturation of follicle, embryo implantation failure, endometrial receptivity failure, reduced endometrial angiogenesis, reduced uterine blood flow, reduce in uterine myometrium.[6,9] ectopic pregnancies and spontaneous abortions, stillbirths,[8] Aqueous acetone is known to be abortifacient,[10].
3.	Sanitary pads ,[11] incinerated waste and through dioxin containing animal food, [9]	Dioxin (TCDD) ,[9]	Synthetic material used as a bleaching agent, [11].	According to WHO, provisional tolerable monthly intake of 70 picogram/ kg body weight. Daily exposure volumes were estimated to be 0.000024- 0.00042pg teq/kg/d, [11] Cumulative toxicity is the major concern, [9].	Anti-estrogenic effect, interfere with the maintenance of pregnancy, foetal growth, and development, and fecundity and fertility parameters. Severity of endometriosis,[9].
4.	Sanitary pads, [10].	Furan, [10].	Pesticide in cotton cultivation	20 or 40 mg/kg body weight causes toxic effects, [10].	Reproductive toxicity cancer and infertility, [10].

5.	Lipstick, surma, Occupational exposure, paints, poisoning, [10].	Lead,[11]	Colouring agent,[11]	Lower doses are more toxic. Damages to female reproductive health can occur at lower levels of exposure than in men Low-to-moderate blood lead levels (BLL) (0–30 μg/dl),[12] Blood levels above 5 ug/dl causes reproductive toxicity, [11].	Clearly effects on luteal phase of ovulatory cycle, reduces progesterone levels, Spontaneous abortions, premature delivery, gestational DM and HTN, pre-eclampsia, premature rupture of membranes, intrauterine growth restrictions, and other pregnancy complications, infertility,[10]. According to the Centers for Disease Control and Prevention (CDC), lead poisoning can pass from a person to their unborn baby and cause a miscarriage, premature birth, [13].
6.	Nail polish, perfumes, [14].	Pthalates, [14].	Used to make nail polish less brittle, [14].	Pthalates have low acute toxicity with a median lethal dose of 1-30g/kg body weight bio accumulation occurs, [14].	Disrupt hormone levels, affect fertility, [14].
7.	Acrylic nails, [15].	Methyl acrylate, [15].	Hardening agent, [15].	Permissible doses 10ppm average over an 8 hour work shift, [15].	Radioactivity is proved Damages to female reproductive health can occur at lower levels of exposure than in men, [15].
8.	Almost all hair and nail products, occupational exposure, soaps and shampoos, [15, 16].	Formaldehyde	Preservative	Most of the nail polish contain 0.02-0.5% of formaldehyde,[16]. 0.75ppm of air measured as an 8-hour time- weighted average. A short term exposure limit of 2ppm which is max exposure allowed for 15mins period, [17]	Reproductive toxicity ,carcinogen, menstrual irregularities, delayed conception, endometriosis, salpingo-oophoritis, alteration of female reproductive and endocrine system Genotoxic,[16,18] Spontaneous abortions, reproductive toxicity, [19]
9.	Cosmetics, face creams, [20].	Estrogenic compounds,[20].	Cosmetic agent, [20].	Smaller levels can easily get absorbed and acts as bodily oestrogen, [20].	Endocrine disruptors, [20]
10.	Food, medicine, sunscreen products and cosmetic, [21].	Titanium dioxide, [21].	Colouring agent in food and cosmetics, UV filter, [21]	Greater than 10 mg/kg body weight doses for 90 consecutive days, [21].	premature ovarian failure, ovarian damage, reduces fertility, reduction in levels of estradiol, progesterone and

					Inhibin b and increase in LH, FSH, anti-mullerian hormone, TSH, Free T3 T4, anti-nuclear antibody and thyroid peroxidase antibody levels in serum, [21].
11.	Widely used in personal care and household products,[22].	Triclosan[22].	Antibacterial and anti-fungal agent	Highest level (>4.5 ng/mL),[22].	Compared with low triclosan levels, high triclosan levels were associated with increased risks of abnormal menstruation and prolonged menstrual cycle and also associated with a 23% of reduction in fecundability and there tended to be a dose-response pattern,[22].
12.	Sea foods, and contaminated water, [23].	Mercury,[23].		Blood levels above 5 ug/dl, [7].	Infertility,[23].
13.	Groundwater contamination, [8]	Tetrachloroethylene, [8].	Used in dry cleaning of clothes	Minimum level of contamination causes effects, [8]	Women drinking groundwater with tetrachloroethylene (PCE) contamination suffer over a doubled risk of spontaneous abortion, [8]
14.	hair dresser, food preservatives, [19].	Nitrosamines, [19].	Preservatives	Chronic exposure at site of occupation is found to cause, [19]. highest limit of 96 ng/day for NDMA [27].	Reproductive disorders, spontaneous abortion, teratogenic agents, carcinogenicity, adverse effects on menstrual function, rate of spontaneous abortion, [19].
15.	Plants and plant product,[8].	DDT, PCB, dicamba, glyphosate, organophosphates, thiocarbamates, [8].	Pesticide	Chronic exposure due to occupation DDT : Permissible – 1mg/m^3 Recommended- 0.5mg/m^3 Immediate danger- 500mg/m^3, [28]. PCB: 1.0 milligrams per cubic meter (mg/m3), [28].	Fertility goes down. Women with the highest levels of PCBs have a serious 50% decrease in their ability to get pregnant and if become pregnant are much more likely to miscarry. In women farmers in Ontario, fertility decreased in proportion to pesticide use. The worst pesticides and herbicides appear to be dicamba (49% decrease in fertility), glyphosate (39%), 2, 4-D (29%), organophosphates (25%), and thiocarbamates (24%). When infertile couples seek IVF, those with the

					highest levels of PCBs were much more unlikely to achieve pregnancy,[8]. Exert serious impact on reproductive system by acting on the endocrine system in vertebrates, the anti-gonadal effects- direct inhibitory effect on ovaries and testis, impairs functions at any level of hypothalamo pitutary gonadal axis, [25]. Longer time to pregnancy among women whose spouses work in greenhouses. Spontaneous abortions in wives and birth defects in children of farmers or pesticide applicators. Women with infertility more likely than controls to be exposed to pesticides, [26].
16.	Oil based paint, thinner, cosmetic, [14]	Ethylene glycol, [14].	Anti-freeze agent	2.0 milligrams per kilogram body weight per day (mg/kg/d),[29]	According to American pregnancy association, increases chances of miscarriage, reproductive toxicant, ovarian dysfunction, decreasing folliculogenesis, decreases the plasma progesterone, [14].