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Herbal Sanitary Napkins - Acceleration towards Women's Health!

V. ArunNivas*, T. ShriVijayaKirubha, R. Senthamarai, M.U. Jiji Mohan, V. Selvakumari, K.S. Pragathi

Department of Pharmacognosy, Periyar College of Pharmaceutical Sciences, Tiruchirappalli, 620 021, Tamil Nadu, India.

***Corresponding Author:V. ArunNivas**
Email: arunnivasv97@gmail.com

ABSTRACT

Menstruation is an integral part of women's life and sanitary napkins are too. While on her menstruation periods, a woman surely experiences discomfort, irritation and menstrual pain. In current days sanitary napkins widely used are synthetics which do not have any cotton materials and there are dangerous chemicals which may stay in body for 20 years after the exposure. Dioxin is a byproduct of chlorine bleaching process used in the manufacture of tampons, sanitary napkins and diapers. WHO list dioxin as one of the dirty dozen- a group of dangerous chemicals. In similar ways the fragrances and deodorants used in napkins nowadays can enter the blood stream and affect locally in the vagina which causes several discomfort and diseases viz. cervical cancer, Urinary Tract Infection (UTI), Poly Cystic Ovary Syndrome (PCOS), rashes, allergic conditions, etc. In recent years, distinct herbal extracts are used in the manufacture of Herbal Sanitary Napkins, that act as an antiseptic, astringent, antimicrobials, deodorizer, antiperspirants, treats inflammation, enhance metabolism, enhances hormonal balances etc. The performance of the herbal sanitary napkins is assessed by absorbency capacity, skin irritation test, vertical wicking, wet back test, leakage proof test, antimicrobial activity test. Herbal core are being anticipated as best menstrual hygiene pads without any side effects for women. The decisive aim of this presentation is focused towards the exploration of Herbal Sanitary Napkins that would accelerate the women's health to greater extent!

Keywords: Dioxin, Evaluation, Herbal Sanitary Napkins, Hygienic menstruation, Women's health

INTRODUCTION

One of the major physiological changes in adolescent girls is menstruation. Menstruation is a natural process but is still a taboo in society as it is considered unclean and dirty. Consequently, reducing mental stress and discomforts during the menstruation period is an important quality of life issue for women. Menstruation and menstrual practices still face many social, cultural and religious restrictions which are a big barrier in the path of menstrual hygiene management. Inaccurate and incorrect knowledge about menstruation is the reason for the poor personal and menstrual hygiene management. Menstrual bleeding normally last for

3-5 days and occasionally upto 7 days, on these days there is continuous usage of sanitary napkins. Girls and women have shyness and less knowledge about reproductive tract infections due to the usage of certain synthetic sanitary napkins. There is a need to educate and make women aware about the health hazards and environmental pollution associated with them. Awareness should be created to emphasize the use of natural sanitary products made from materials like banana fibre, bamboo fibre, sea sponges, water hyacinth, and so on [1, 2].

Sanitary napkins in menstruation [3, 4]

Sanitary napkins used nowadays, during the menstruation periods are not really made up of pure cotton, instead of these they are made with various plastic chemicals (like Bisphenol A [BPA] and Bisphenol S [BPS]), polymers such as polyethylene (PET), polypropylene, polyethylene glycol (PEG), Polyurethanes, odour neutralizers and laced with artificial colors. Contaminants leads to various body defects such as hormonal disruption, infertility, cervical cancer, Urinary Tract Infection (UTI), Poly Cystic Ovary Syndrome (PCOS), rashes, allergic conditions, etc.

Also there is a possibility for Toxic Shock Syndrome (TSS) caused due to poisonous toxins from the bacteria such as *Staphylococcus* and *Streptococcus* that are accumulated in reproductive organs. Apart from all these, a dangerous chemical called Dioxin is a byproduct of chlorine bleaching process used in manufacture of napkins for fine color. The effect of dioxin are cumulative and may stay in the body for 20 years after exposure.

WHO lists dioxin as one of the dangerous chemicals known as persistent organic pollutants, hence these dioxins, other fragrances and deodorants can enter into the blood stream and affect locally and the immune system causing various diseases.

Herbal sanitary napkins

To avoid the above said disorders, the sanitary napkins need to be manufactured with the help of natural resources that results in herbal sanitary napkins. The key criteria for selection of Herbal sanitary pads are:

Hygiene

Sanitary waste disposal has become an increasing problem in India, thus biodegradable napkins should be made.

Performance

Women generally prefer sanitary napkins based on their absorptive capacity.

Disease free

Napkins should have less side effects and should not cause wide range of diseases.

Comfort

Napkins should be comfort and not produce any unpleasant odour as they are used throughout the day during menstruation.

Cost

Sanitary napkins should be available at an affordable cost that every women can buy. Based on the above criteria herbal sanitary napkins should be made. This will promote hygienic menstruation around the world and there is avoidance of several diseases caused due to the harmful synthetic sanitary napkins [5, 6].

Herbal resources

Organic cotton as top sheet is one the commonly advised raw material for sanitary napkin because of its non-irritant, skin friendly and superior liquid retention properties. It is soft and breathable which gives comfort and dryness. Cotton wicks away moisture and keeps skin dry. Organic cotton are cultivated from non-treated Genetically Modified (GMO) seeds and is grown using method and materials having low impact on environment that is without any use of synthetic agricultural chemicals such as fertilizer and pesticides. The cotton should be biodegradable in nature. The ideal moisture management of this cellulosic fiber is responsible for the reduced bacteria growth. The primary requirement of sanitary pad is absorbency of menstrual fluid. Therefore, selection of core material totally depends on the absorbency and retention property of fibre.

Bamboo fibre *(Bambusa vulgaris)* is a novel alternative raw material for absorbent core. Bamboo absorbs and wicks water 3 to 4 times better than cotton and reduces odour as the fiber is

filled with multiple micro holes and micro gaps. Bamboo is soft to feel as the fibre is naturally round in shape and it does not require any chemical treatment to smoothen it. An additional significant property of bamboo is the antimicrobial agent, bamboo kun naturally present in it.

Sanitary pads can also be developed from banana (*Musa paradisiaca*) fibre to make affordable, quality, eco-friendly sanitary napkins and available in recent years to girls and women in developing country. Banana is a natural absorbent fibre; the key reason is its natural porosity. Banana fibre is an eco-friendly fibre like jute fibre (*Corchorusolitorius*). It is biodegradable and has no negative effect on environment. Rather than these jute fibres can also be used.

An alternative for synthetic back sheet is the PLA (Poly Lactic Acid) fibre, which is derived from corn starch using latest biotechnology. It is most promising thermoplastic biodegradable polymer material.

Apart from all these, natural antibacterial agents such as extracts of neem (*Azardirachta indica*), turmeric (*Curcuma longa*), Aloes (*Aloe barbadensis*) and other natural antibacterial agents and natural fragrances are also used in manufature of sanitary napkins [7, 8, 9].

Fig no.1 Cotton

Fig no.2 Bamboo fibre

Fig no.3 Jute fibre

Fig no.4 Banana fibre

Fig no.5 Aloes

Fig no.6 Neem

Fig no.7 Turmeric

EVALUATION OF NAPKINS [9, 10]

Absorbency test

This method determines the total absorption capacity of the material. According to the test standard ISO 5405 -1980, a sample is laid on a flat level and transparent surface, so that the underside of pad can be observed. Fluid is to be dripped, at the rate of 15ml per minute, so that 30 ml of the fluid maintained at a temperature of 27^0 C is poured on to the centre of the sanitary pad from a height of approximately 1 to 2 mm. After the napkin has absorbed the full amount of fluid, the standard weight of 1 kg is put above the sample for a minute on the portion where the fluid is absorbed. After that the back and sides of the pad are observed for fluid flowing up. The reading is recorded.

Fluid retention capacity

The measurement of fluid retention is determined by using the standard ASTM D 461. A sample of the pad is to be immersed in fluid at room temperature for five minutes to completely wet it out. The fluid logged sanitary napkin is weighted, dried and reweighed. Fluid retention is calculated as a percentage of dry mass.

Liquid strike through test

A drop of test solution is allowed to fall on the sample and the time taken for the solution to transport from the upper layer of the napkin to the inner layers of the sample. This is measured by observing the drop closely so that the dull wet spot is seen on the wet area of the sample. All samples should be conditioned for 24 hours before the tests.

Wicking experiments

Tests can be done according to BS3424 Method 21 (1973) which specifies "determination of resistance to wicking." The experiment is meant to test the ability to take up fluid. One end of the pad is immersed to about 10mm in the synthetic blood and the fluid absorption along the pad is measured in mm after 30 minutes. Wicking is a desired characteristic of a sanitary pad as it allows fluid to spread along the entire absorbent structure.

Leakage proof experiment

The test is carried out according to EAS 96:2008-Annex B standard. It determines the efficiency of barrier layer. A specimen size of 6.5cm X 6.5cm barrier sheet is cut and folded into a cone and placed in a funnel. The funnel filled with test fluid is kept for 48hrs, and then checked for any leakage.

Antimicrobial screening

Antimicrobial test carried out using Agar Diffusion test against gram positive bacteria (*Staphylococcus aureus, Streptococcus sp*) and gram negative (*Pseudomonas aeruginos*) bacteria. The treated samples are to be placed on the incubated agar plate Development of Herbal finished Sanitary Napkin with test bacteria for 24hrs at 37˚C. After incubation the samples assessed visually the area of inhibition measured for antimicrobial efficiency.

FUTURE PERSPECTIVE

Herbal Sanitary Napkins made up of herbal materials, passing all the evaluation tests such as absorbency, antibacterial, softness will definitely promote healthy and hygienic menstruation in women and will also drop down the several drastic diseases that are caused due to harmful synthetic sanitary napkins and unhygienic menstrual activities.

CONCLUSION

Menstrual hygiene should be promoted by implementing the herbal sanitary napkins at the time of menstruation and menstrual hygiene management. These napkins might satisfy the needs i.e. affordable, hygienic, biodegradable and sustainable alternative solution to manage menstrual days and make every women hale and healthy who crosses the period of menstruation in her life time.

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