Menopause: Role of Dietary Phytoestrogens in Maintaining Menopausal Health

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ABSTRACT

Menopause is the time in a woman's life at which she can no longer reproduce. Symptoms of perimenopause, menopause, and postmenopause vary greatly from woman to woman. However, common symptoms of menopause include hot flashes, mood changes, fatigue, stress, tiredness, vaginal dryness, itching and complications such as osteoporosis, urogenital atrophy, heart problems, diabetes. HRT has been used for the treatment of menopausal symptoms for last many years, however HRT has been considered as an unfavorable procedure due to its non-availability to the poor and rural masses and several adverse affect. Hence dietary modification can be more efficient in managing menopausal symptoms and can be made available to poor population also. There are several non-nutrient components such as Phytoestrogen present in the diet which helps in maintaining good health status. The word phytoestrogen is derived from word "phyto" meaning plants and "estrogen" due to their ability to affect estrogenic activity in the body. Phytoestrogen are naturally occurring phytochemicals found in foods of plant origin and posses wide range of biochemical benefits. Phytoestrogen are phenolic non-steroidal compounds possessing estrogen like activity their structure is similar to estrdiols, the basis for their hormonal activity so they can bind to estrogen receptors and have a beneficial role in humans against deficiency of estrogen. These chemical components help in relieving menopausal symptoms. Hence the present research focuses on menopausal symptoms including complications and how menopausal symptoms can be contradicted by incorporation of dietary modification in diet of menopausal females.

Keywords— Menopausal Symptoms, Dietary Phytoestrogens, estrogens, phytochemicals

1. INTRODUCTION

Menopause is a natural part of a women's life when she no longer experiences menstruation. There is decline in progesterone and estrogen production eventually leading to cessation of periods. Perimenopause is the stage around menopause during which menstrual cycle and endocrine changes occur resulting into reduction in number of days of flow and skipping of periods one or more months during several years before complete cessation (Goyal, et al., 2012). At present the menopausal population of India is estimated to be about 103 million. Beginning of fertility ie at puberty with onset of first menstrual bleeding and ending of menopause is marked by hormonal changes in a women's life. The average age for onset of menopause is 45-51 and it is defined as having taken place when women completes 12 menstrual cycles without any menstrual bleeding. After menopause the ovaries stop producing estrogen a hormone that helps in preventing bone loss leading to alteration in bone metabolism (Wark, 1996). Hormone Replacement Therapy (HRT) has been used for the treatment of menopausal symptoms for last many years. Women's Health Initiative (WHI), 2002). However, HRT has been considered as an unfavorable procedure due to its non-availability to poor and the rural masses and severe

adverse effects. There are several non-nutrient components in such as Phytoestrogen present in the diet helps in maintaining good health status. Phytoestrogen are naturally occurring phytochemicals found in foods of plant origin and posses wide range of biochemical benefits (Arena, Rappa, Del Frate , Cenci , Villani , 2002). These are plant-derived substances structurally similar to estrogens that have been shown to bind to estrogen receptors. These are used as alternatives to hormone therapy (Adams and Cannell, 2001).

2. COMMON MENOPAUSAL SYMPTOMS

The onset of menopause is accompanied by vasomotor symptoms such as hot flashes and night sweats, somatic symptoms such as fatigue, body aches, and vaginal dryness, and psychological symptoms such as irritability, anxiety, depression, decreased libido, and difficulty sleeping. The frequency, severity, and duration of vasomotor symptoms vary according to the population (Sturdee, 2008). Hot flashes are described as sudden, transient sensation of warmth or heat that spreads over the body, creating a flushing, or redness, that is particularly noticeable on the face and upper body. The experience of hot flashes can range between delicate flushes and a sensation of engulfing flames. They result from the body's reaction to a decreased supply of the hormone estrogen, which occurs naturally as women approach menopause. In certain menopausal females the ovaries stop estrogen production more abruptly; for these women, hot flashes can be a rollercoaster ride. Common symptoms of hot flushes include sudden, intense feelings of heat rapid or irregular heartbeat and pulse. Heart palpitations may occur flushing, perspiration Sweating can range from mild to profuse. Cold chills, this often follow hot flashes, though sometimes women experience only the chill. Nausea, dizziness, anxiety, and headaches are other symptoms associated with hot flashes. Night sweats, classified as severe hot flashes that occur during sleep accompanied by intense bouts of sweating. Also known as “sleep hyperhidrosis”, night sweats aren't actually a sleep disorder, but a common perspiration disorder that occurs during sleep in menopausal women. These episodes of nighttime sweating can range in severity from mild to intense, and can be caused by hormonal imbalance combined with environmental factors, such as an excessively warm sleeping environment. For many women, the experience of night sweats is so severe that it disrupts sleep, and it may increase irritability and stress in a woman's waking life. Night sweats can also be caused by underlying medical conditions, so it is important to get to the root of the issue before seeking treatment options. Irregular Periods, most women will experience absent, short, or irregular periods at some point in their lives. A wide range of conditions can cause irregular periods, though during perimenopause the most common cause is hormonal imbalance. Periods may come earlier or later than before; bleeding may be lighter or heavier than usual; and periods may be brief or go on for what feels like an eternity. Skipping periods and “spotting” - bleeding between periods - are also common symptoms of hormonal imbalance. Menstrual irregularity is most common in a woman in her mid-40 as she approaches menopause; the most likely cause of this is hormonal imbalance caused by decreasing levels of estrogen and progesterone. Irregular periods could also be caused by other medical conditions or even pregnancy. The walls of the vagina stay lubricated with a thin layer of clear fluid. The hormone estrogen helps maintain this fluid and keeps the lining of the vagina healthy, thick, and elastic. During menopause, the drop in estrogen levels reduces the amount of moisture available causing vaginal dryness. It also makes the vagina thinner and less elastic. This is called vaginal atrophy. It causes irritation in vagina and also has adverse effect on sex life of female.

Loss of libido can be one of the most difficult symptoms of menopause to manage, often because a woman might not understand how and why she has lost the desire to be physically intimate with her partner. It is important to recognize that loss of libido during menopause is common, affecting as many as 20 - 40% of women. Mood Swings, Menopausal mood swings are surprisingly common, but can be hard to cope with. A woman experiencing mood swings may feel like she is on a rollercoaster of emotions: one minute she's up, the next minute she's down. Mood swings can be sudden and intense, although the experience of them may differ from woman to woman. Chronic and severe mood swings are a psychological disorder, a health problem every bit as real as a physical ailment. They are caused primarily by hormonal imbalances; when production of the hormone estrogen drops, so too does the production of mood-regulating

neurotransmitters, resulting in mood swings. Other menopause symptoms can also have a negative influence on mood, such as fatigue. Therefore, targeting the underlying hormonal imbalance is one of the most effective ways of reducing menopausal mood swings. Weight gain occurring due to hormonal imbalance the female starts gaining weight from perimenopausal stage due to deposition of fat. The deposition of fat predominantly occurs on the abdominal area leading to abdominal obesity. Abdominal obesity leads to unfavorable health outcomes including increased risk of diabetes, cardiovascular disease, some cancers, urinary incontinence, and musculoskeletal disorders (Davis, 2012). Cardiovascular disease is the principle cause of morbidity and mortality in postmenopausal women (Sturdee and Pines 2011).

3. COMPLICATION DURING MENOPAUSE

Estrogen deficiency in females causes numerous symptoms which produces negative effect on the quality of life, such as hot flushes, night sweats, virginal dryness, urinary incontinence, sexual discomfort, cardiovascular disease, Alzheimer diseases diabetes, colon and breast cancer, and weight gain (Barclift and Jones, 2012). Osteoporosis is characterized by skeletal degeneration with low bone mass and destruction of micro architecture of bone tissue which is attributed to various factors including inflammation. Women are more likely to develop osteoporosis than men due to reduction in estrogen during menopause which leads to decline in bone-formation and increase in bone-resorption activity. Estrogen is able to suppress production of pro inflammatory cytokines such as IL-1, IL-6, IL-7, and TNF- (Nadia et al., 2012). This is why these cytokines are elevated in postmenopausal women. The estrogen deficiency is known to cause significant alterations in bone metabolism; it results in decrease in bone density which ultimately leads to osteoporosis (Wark, 1996). Estrogen deficiency also increases the life span of osteoclasts and decreases the life span of osteoblast thus increasing bone catabolism leading to osteoporosis. (Hughes et al., 1996).

4. ROLE OF PHYTOESTROGEN IN RELIEVING MENOPAUSAL SYMPTOMS

The efficacy of hormone therapy (HT) in disease prevention was studied by Women's Health Initiative (WHI) and the results demonstrated that use of estrogen plus progestin therapy for an average of 5 years increased breast cancer, stroke, and coronary heart disease risk in healthy postmenopausal women (WHI, 2002). More recently, the WHI has also identified an increased risk of stroke, but not breast cancer or coronary disease, with the use of estrogen therapy alone for an average of 7 years in postmenopausal women (WHI, 2004). Hence dietary estrogens are emerging as a valid alternative to estrogen in treatment of menopause related complications. In a survey of 866 women, aged 45–65 years, enrolled in a health maintenance organization, 22.1% had used an "alternative therapy" for menopausal symptoms. The most commonly used types of therapies were herbal, homeopathic, or naturopathic therapies (13.1%); relaxation or stress management (9.1%); and soy dietary products (7.4%). Sixty-one percent of women surveyed agreed or strongly agreed with a statement that natural approaches are better than hormone pills for menopausal symptoms. (Newton, Buist, Keenan, Anderson and LaCroix, 2002) . Phytoestrogen are naturally occurring phytochemicals which exerts protective effects against many western diseases such as cancerous illnesses of breast, prostate, and colon, cardiovascular diseases, dyslipidaemia, post-menopausal symptoms and osteoporosis (Mishra and Devanshi, 2011). Phytoestrogen are classified into three main classes and the food sources where they are found include following:- Isoflavones: Soya bean and soy products are richest source of isoflavones. Soybean contains highest concentration of isoflavones, i.e., up to 300 mg per 100 gm. Other sources include Wheat, Bengal gram, moong beans, chick peas, cherries, parsley, apples, alfalfa and red clover etc. Lignans: are found in oil seeds such as flax seeds (linseed), rye, millet, sesame seeds besides legumes, pulses, and whole grains. Coumestans: Sunflower seeds, alfalfa and clover are rich sources besides bean sprouts. Soya sprout is potent source of Coumestans (Murkie , Wilcox , Davis , 1998 ; Thame , Gardener , Haskell , 1998).

These classes of phytoestrogen are linked to lower incidences of cancers, relieving menopausal symptoms, heart disease and risk of osteoporosis. Recent studies have highlighted their potential protective effect against hormone-dependent cancers and age related diseases and conditions. (Mindy S. Kurzer and Xia Xu, 1997). Among various classes of phytoestrogen the

most important of these is Isoflavone which are natural non-steroidal molecules with structural similarity to 17-beta oestradiol and selective oestrogen receptor modulators (SERM). Isoflavones have a phenolic ring which is essential for binding to oestrogen receptor. In addition to this, they have lower affinity for serum protein and hence better bioavailability at receptor site (Mishra, Mishra and Devanshi, 2011). Soy foods having highest concentration of natural isoflavone which reduces the risk of coronary heart disease. Moreover, whole-soy protein maintains lipid profile, arterial compliance, atherosclerotic plaque, blood pressure. (Greaves , Wilson , Radel *et al, 2000;* Anthony , Clarkson , Williams , 1998). Soy foods having highest concentration of natural isoflavone which reduces the risk of coronary heart disease. Moreover, whole-soy protein maintains lipid profile, arterial compliance, atherosclerotic plaque, blood pressure. (Greaves, Wilson , Radel *et al, 2000;* Anthony , Clarkson , Williams , 1998). Phytoestrogen rich diet alters the vaginal cytology maturation index to a more estrogenic epithelial pattern. It has a favorable role to play in vaginal dryness in post-menopausal women. (Hickey , Davis and Sturder 2005). Isoflavones help in preservation of the bones and fight osteoporosis. In spite of their weak estrogenic action, they have a powerful bone building effect. (Mei, Yeung and Kung, 2001). Genistein directly inhibits osteoclast activity, thereby causing a decrease in osteoclast-induced bone loss during menopause instead of causing enhancement of bone mass. Phytoestrogen also have a conservatory effect on calcium excretion. (Anderson, Anthony and Messina *et al,1999).* Phytoestrogen mimic the endogenous estrogen, hence exert hormonal action. Genistein inhibits tyrosine protein kinase, which is coded by proto-oncogenes and plays a key role in tumourigenesis. It also inhibits DNA topoisomerase I and II and may prevent cell mutation by stabilizing cell DNA. Diadzein and genistein both have got established antioxidant properties. Genistein has been shown to inhibit angiogenesis38; it induces apoptosis and may reduce malignant cell metastasis. (Fotsis, Peper and Adlercreutz, 1993). Hence lifestyle modifications and healthy diet are buzz words of modern medicine and natural phytoesterogens can one of the healthiest alternatives in ensuring relief from menopausal symptoms and maintaining menopausal health.

REFERENCES

[1] Goyal, S., Malagi, U., Naik, R. and Kasturiba, B. (2012) Menopausal symptoms and nutritional status of perimenopausal women. *Karnataka J. Agric. Sci.*,25 (4) : 506-509.

[2] Sturdee, D.W. (2008) The menopausal hot flush: anything new? *Maturitas*.60:42–9.

[3] Principal Results from the Women's Health Initiative (WHI) randomized controlled trial: Risk and benefits of oestrogen plus progestin in healthy post-menopausal women. *JAMA 2002*; 288: 321-33.

[4] Arena, S., Rappa, C., Del Frate, E., Cenci, S., Villani, C. (2002). A natural alternative to menopausal hormone replacement therapy. *Phytoestrogens. Minerva Ginecol* ;54:53-7.

[5] Adams, C., Cannell, S. (2001) Women's beliefs about "natural" hormones and natural hormone replacement therapy. Menopause;8:433– 40.

[6] Barclift, S., &. Jones, L.M. (2012). Menopause and menopause treatments.

[7] Sturdee, D.W., & Pines, A. (2011). Updated IMS recommendations on postmenopausal hormone therapy and preventive strategies for midlife health. Climacteric: *The International Journal of the International Menopause Society*, 14(1), 302-320.

[8] Davis, S. R. (2012). Understanding weight gain at menopause. Climacteric: The *International Journal of the International Menopause Society*, 15(5), 419-429.

[9] Wark, J.D. (1996). Osteoporotic fractures: Background and prevention strategies. *Maturitas. ;2*:193–207.

[10] Nadia, M. E., Nazrun, A. S., Norazlina, M., Isa, N. M., Norliza, M. and Ima Nirwana, S. (2012) The Anti-Inflammatory, Phytoestrogenic, and Antioxidative Role of Labisia pumila in Prevention of Postmenopausal Osteoporosis.

[11] Writing group for the Women's Health Initiative Investigators. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results from the Women's Health Initiative randomized controlled trial. *JAMA* 2002; 288:321–33.

[12] Women's Health Initiative Steering Committee. Effects of conjugated equine estrogen in postmenopausal women

with hysterectomy: the Women's Health Initiative randomized controlled trial. *JAMA* 2004; 291:1701–12.

[13] Newton, K.M., Buist, D.S.M., Keenan, N.L., Anderson, L.A., LaCroix, A.Z. (2003) Use of alternative therapies for menopause symptoms: results of a population-based survey *Obstet Gynecol*; 101-205.

[14] Adlercreutz, H. (1990) Western diet and western diseases: some hormonal and biochemical mechanism and associations. *Scand J Clin Lab Invest ; 50:* 210-23.

[15] Greaves, K., Wilson, M.D., Radel, A. et al. (2000) Consumption of soy protein reduces cholesterol absorption compared to casein protein alone or supplemented with an isoflavone extract or conjugated equine estrogen in ovariectomised cynomolgus monkeys. *J Nutr*; 130: 820.

[16] Mishra, N., Mishra, V.N., Devanshi.(2011). *Natural Phytoestrogens in Health and Diseases; 12(3)*: 205-11

[17] Murkies, A.L., Wilcox, G., Davis, S.R.(1998). *Phytoestrogens. J Clin Endocrinol Metab ;83*:297-303

[18] Mindy, S., Kurzer, Xia Xu. (1997). *Dietary Phytoestrogens. Annu. Rev. Nutr.17*: 353-381.

[19] Hickey, M., Davis, S.R., Sturder, D.W. (2005). Treatment of menopausal symptoms, what shall be do? *Lancet;366*: 409-21.

[20] Mei, J., Yeung, S.S., Kung, A.W. (2001). High dietary phytoestrogen intake is associated with higher bone mineral density in post-menopausal but not premenopausal women. *J Clin Endocrinol Metab* ; 86: 5217-21.

[21] Anderson, J.J.B., Anthony, M., Messina, *et al.* (1999). Effects of phytoestrogens on tissues. *Nutr Res Rev ; 12*: 75-116.

[22] Fotsis, T., Peper, M., Adlercreutzm, H. *et al.* (1993). A dietary derived inhibitor of angiogenesis. *Proc Natl Acad Sci USA ; 90*: 2690-4.

[23] http://www.avogel.co.uk/health/menopause/hot-flushes

[24] http://www.avogel.co.uk/health/menopause/night-sweats

[25] http://www.webmd.com/women/guide/vaginal-dryness-causes-moisturizing-treatments#1

[26] http://www.medicinenet.com/menopause/article.htm

[27] http://www.34-menopausesymptoms/

