AFRICAN WOMEN EXPERIENCING PERIMENOPAUSE: STRESSES

By

Dr. Brenda Nelson-Porter

A Paper Presented in Partial Fulfillment

of the Requirements for the International PhD

World Information Distributed University (WIDU)

February 2014

Updated September 2017

African Women Experiencing Perimenopause: Stresses

This paper focuses on women in the poorer nations, such as in Africa, who experience perimenopause and are coping with symptoms associated with perimenopause. Stress is a symptom associated with amenorrhea and perimenopause. "Amenorrhea is the absence or abnormal cessation of the menses," and perimenopause is a state of health affecting women between the ages of 20-45 that involves hormonal changes ("American Society for Reproductive Medicine," 2008, p. S219; "Perimenopause Symptoms," n.d.). The Premenstrual Dysphoric Disorder (PMDD) is a severe form of premenstrual syndrome (PMS) whereby somatic and emotional disturbances result in distress (Batra & Harper, 2003). A comparative analysis of stresses that may be experienced by African women, with stresses experienced by unicellular organisms and plants, can be processed from the literature. Natural methods aimed to approach or distinguish stresses will be presented.

Forms and Origin of Stresses

Based on the physiological state of being of unicellular organisms, such as microbes, when severe stress occurs, death more likely occurs (Yousef & Courtney, 2002). Stresses to microorganisms during food production and processing include physical treatments (heat), biological stresses (competition/microbial metabolites), and addition of chemicals (oxidants/ salts; Yousef & Courtney, 2002). The inability of living systems to adapt or make sustained adjustments to stresses result in physiologic changes, injury, diseases, or death (Berga & Loucks, 2007; Kuma, Abbas, & Aster, 2012; Lorentz, 2006; Yousef & Courtney, 2002).

Physical treatment. "Heat stress is a buildup of body heat generated either internally by muscle use or externally by the environment" (Ohio State University, n.d., Background section). Hyperthermia, an abnormally high body temperature, may result from heat stress when the body cannot adapt to the heat generated by the environment (National Institute of Health, 2012).

Stress can cause some individuals to experience headaches (Digre, Baggaley, Brennan, & Jeffries, 2011). Headaches, migraines, heat exhaustion, and heat strokes are symptoms of heat stress (Ohio State University, n.d.). When some women in South Africa work in the summer heat combined with pollen to cultivate crops and plants, the women may experience a tension headache (Digre et al., 2011; Kaye, 2010; Peter, 2008).

Plants have mechanisms to sustain the heat (abiotic/natural stresses) though unknown processes associated with nitric oxide (NO) influenced by enzymatic activities [nitrate reductase (NR); Arasimowicz & Floryszak-Wieczorek, 2007; Bouchard & Yamasaki, 2008]. Plants also undergo osmotic stress, which "leads to efflux or influx of water from or into the cell" (Mager, de Boer, Siderius, & Voss, 2000, para. 2). The growth and development of plants are usually inhibited by salt stress (salinity), an environmental stress, which reduces the water intake (Benhassaini, Fetati, Hocine, & Belkhodja 2012; Noriega et al., 2011). During this process, more biomass is induced to most roots than to the leaves (Benhassaini et al., 2012). When plants are exposed to salt in laboratories, the process stimulates a decrease in growth, then an increase, and finally a decrease (Benhassaini et al., 2012). Heat impacts the germination of plants when heat inhibits NO causing strain on hormonal signaling (Beard, Anderson, Bufford, & Tallman, 2012, Abstract section).

Biological stresses. Bacteria (toxins) that grow because of nutritional deficiencies may lead to infections, whereby high temperatures may be indicators (Life Extension, 2014). When energy becomes deprived from the presence of microbes or a lack of nutrients, biological stresses or physiology stress may aid in the suppression of regular functioning of the nervous, endocrine, or immune systems. Because the immune process is controlled by the neural system, the immune system can become suppressed by neurons after sensing the invasion of/injury by

bacteria, giving rise to cognitive stress (Boston Children's Hospital, 2013). Under cognitive stress, immune system/neurons surrounding the immune system transmit the invasion to the nervous and endocrine systems (Lorentz, 2006; Yousef & Courtney, 2002).

Functional mental reactions that result from psychogenic stress (stress of the mind) have been reported to trigger energy imbalances and reproductive comprises (Berga & Loucks, 2007). The malfunctioning of the hypothalamus (portion of the brain that produces hormones) or ovaries can create hormonal burdens, which may make women more susceptible to bacterial infections (American Society for Reproductive Medicine, 2008; Berga & Loucks, 2007):

- Polymenorrhea: (menstrual interval<24 days/frequent menses)
- Anovulation (no ovulation); anovulatory eumenorrhea (no ovulation but regular menses)
- Oligomenorrhea (infrequent menses/menstrual interval 735 days)
- Amenorrhea (primary and secondary amenorrhea)

Women suffering from amenorrhea are at a lower risk of acquiring bacterial vaginosis (BV), an infection that is classified as a sexually enhanced disease (SED) rather than a sexually transmitted infection, because women who menstruate have high pH levels (STI; Truter & Graz, 2013). The BV infection may affect perimenopausal and postmenopausal women because of the decrease in the oestrogen levels (Truter & Graz, 2013). Women of ethnic origin, such as African and African American women, are more prevalence of BV infections possibly because of hygiene, sexual activities, and social-economic demographic (Truter & Graz, 2013).

Regarding plants, signals of hormones (ethylene) are generated by the roots (Benhassaini et al., 2012; Govindasamy, Senthilkumar, Kumar, & Annapuma, 2008). Roots of the plant have been posited to function similar to the human brain (Baluška, & Mancuso, Volkmann, & Barlow,

2009). Although the germination (reproduction) of plants is not compromised by salty stress, biotic stresses (bacteria) can prevent normal germination and development (Liopa-Tsakalidi, Zakynthinos, Varzakas, & Xynias, 2011). During competition, free-living rhizobacteria, however, increases seed germination and stimulate growth (Govindasamy et al., 2008).

Oxidative stress. Oxidative stress is defined as the state whereby antioxidant defense systems become less active than oxidative processes resulting in oxygen free radicals attacking and modifying proteins and impairing cell signal transduction (Agarwal, Aponte-Mellado, Premkumar, Shaman, & Gupta, 2012; Yoshikawa & Naito, 2002). Enhancing the levels of enzymatic antioxidants, such as "SOD, ascorbate peroxidase, and catalase in transgenic plants (tobacco, maize) slightly improves stress resistance" (Mager et al., 2000). Helpful nonenzymatic antioxidants include Vitamins C and E and beta-carotene (Agarwal et al., 2012). Nitric oxide (NO) has been reported to improve the antioxidant systems by mediating the physiological processes (Noriega et al., 2011).

Postmenopausal women who are at risk of heart disorders restore their vascular nitric oxide (NO) activity using estrogen replacement therapy (ERT), which is composed of either plant, animal, or synthetic-based estrogen (Majmudar, Robson, & Ford, 2000). Although an abundance of research exists on how oxidative stress is associated with diseases or menopause, limited scholarly research covers how oxidative stress influence the perimenopausal transition phase (Agarwal et al., 2012; Arora, Guptan, Singh, Nagpal, & Arora, 2009; Tiyong Ifoue et al., 2009). When antioxidant systems become less active, middle-aged women may experience perimenopausal symptoms, such as distress; postmenopausal women, however, are reported to experience a higher degree (Agarwal et al., 2012; Arora et al., 2009). Although physical, biological, and oxidative stress signals may derive from environmental sources, such as sun,

heat, ultraviolet (UV) light, and metals (anthropogenic stress), and foods, many lifestyle factors, such as the use of alcohol, drugs, under nutrition, and so forth, cause reactions to internal systems (Agarwal et al., 2012; Mager et al., 2000; Yoshikawa & Naito, 2002).

Experiences of Women in Developing Nations

Many women in other nations do not consume prescription medications to approach menopausal symptoms, such as stress or distress. Of the 25 million women in the United States who move through menopausal transition each decade, many will consume hormonal drugs (pill, patches, and rings) to approach symptoms of menopause (Collin et al., 2007; Consumer Reports, 2008). Many middle-aged women abroad, however, use natural remedies to approach stresses:

- A male from Egypt shared about his mother, "When we got problems or crisis, she got the power and confidence from praying and contact with God. She has fabulous trust in God" (M. Habiebi, social media communication, January 20, 2014).
- A female from Mexico shared women party and meet with friends, "no medication, no herbs....well maybe someone, but not everybody. Mexicans are famous because of drugs, but for the Narco's image, and there are cases of very poor people or very rich people as a consumers, but is not general" (Y. Helgueros, social media communication, January 21, 2014).
- A male in Kuwait City from Hasnabad Bangladesh implied women do not have stress when he shared: "Many women are housewives. Some women teach in school and college. Some women are doing government and private jobs" (M. Naotola, social media communication, January 21, 2014).
- Members of the Indonesia Research Network (social media communication, February 12, 2014) shared their mother either attends pengajian (public sermon) or masjid

(place of worship), goes window or real shopping with female friends (co-workers) at the mall, engages in mostly Ngerumpi (gossiping) with their neighbors, or builds social networking through Internet (FB, Twitter, mailinglist, etc.).

Many African cultures continue to rely on traditional medicines derived from medicinal plant species (Vasisht & Kumar, 2004). Essential oils that derive from medicinal plants have been used for centuries to treat anxiety and stress-related disorders for menopausal women (Freedenberg, 2009). Aromatherapy is a therapeutic approach that involves using essential oils, clary sage, ylang ylang, and lavender to help with stress (Freedenbery, 2009). Lavender is cultivated in South Africa in cold and subtropical climate and can tolerate abiotic stresses (moderate drought and frost), and the oils are sold on the open markets (Republic of South Africa, 2009; Vasisht & Kumar, 2004).

Suggestions to Approach Stresses

The following suggestions aim to help women, to include women in Africa or other nations, who experience stress associated with perimenopause and are not aimed to diagnose, prescribe, treat, or cure. Natural techniques discussed in this paper aim to enlighten women on lifestyles and healthy living. Women who believe their condition results from a medical disease are recommended to seek assistance from an MD or naturopathic doctor (ND) who specializes in psychosomatic illinesses or psychoneuroimmunology (PNI).

In addition to using lavender, women who experience stress in Africa and other nations may consider engaging in mindfulness-based therapy aimed to help with the management, coping, or alleviation of stress. Because “behavior, the autonomic nervous system, the neuroendocrine axis and the immune system” are innate defense mechanisms that respond to stress, psychoneuroimmunologists use or suggest touch, humor, imagery, prayer, and meditation

techniques in an effort to redirect the mind to focus on the techniques and outcome instead of the problem that stimulate stress (Lorentz, 2006; Moberg, n.d., para. 2).

The *Regenerative Nature Intervention Therapeutic Enlightenment* (ReNiTe) was conceived by Dr. Brenda Nelson-Porter as a global initiative whereby seasoned agricultural scientists enlighten hormone researchers on when engaging with the environment (including the ocean and the rainforests) is most appropriate to avoid stresses and derive insight into the regermination processes, which may be further applied to the human reproduction process. Unlike traditional initiatives that involve discussing nutrition or cultivating small gardens, the ReNiTe initiative aims to enlighten hormone researchers on restoring natural behaviors and reactions are founded in the exposure to heat, salts, bacteria, and metals. Documenting the fluctuation of acute to chronic periods of stress may provide insight into environmental factors that generate stress responses that influence the internal systems and hormonal signaling processes. During the perimenopausal transition phase, if external factors that signal stress(es) can be identified, the form of stress or combination of stresses may become readily distinguishable and approachable.

References

Agarwal, A., Aponte-Mellado, A., Premkumar, B. J., Shaman, A., & Gupta, S. (2012). The effects of oxidative stress on female reproduction: A review. *Reproductive Biology and Endocrinology*, *10*(49), 1-31. Retrieved from http://www.rbej.com/content/pdf/1477-7827-10-49.pdf

American Society for Reproductive Medicine. (2008). Current evolution of amenorrhea. *Fertility and Sterility*, *90*(3), S219-S225. Retrieved from http://www.asrm.org/globalassets/asrm/asrm-content/news-and-publications/practice-guidelines/for-non-members/current_evaluation_of_amenorrhea-pdfnoprint.pdf

Arasimowicz, M., & Floryszak-Wieczorek, J. (2007). Nitric oxide as a bioactive signalling molecule in plant stress responses. *Plant Science, 172*, 876–887. Retrieved from http://www.fitorem.unah.edu.cu/Curso%20Bioquimica%20Vegetal%20Avanzada/Materiales%20did%C3%A1cticos/Oxido%20nitrico,%20molecula%20senal%20en%20estres.pdf

Arora, K. S., Guptan, N., Singh, R. A., Nagpal., S., Arora, D. (2009). Role of free radicals in menopausal distress. *Journal of Clinical and Diagnostic Research, 3*, 1900-1902. Retrieved from http://www.jcdr.in/articles/PDF/612/752.pdf

Baluška, F., & Mancuso, S., Volkmann, D., & Barlow, P. W. (2009). The 'root-brain' hypothesis of Charles and Francis Darwin. *Plant Signaling and Behavior, 4*(12): 1121–1127. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2819436/

Beard, R. A., Anderson, D. J., Bufford, J. L., Tallman, G. (2012). Heat reduces nitric oxide production required for auxin-mediated gene expression and fate determination in tree tobacco guard cell protoplasts. *Plant Physiology, 159*(4), 1608-1623. doi:http://dx.doi.org/10.1104/pp.112.200089. Retrieved from http://www.plantphysiol.org/content/159/4/1608.abstract

Benhassaini, H., Fetati, A., Hocine, A. K., Belkhodja, M. (2012). Effect of salt stress on growth and accumulation of proline and soluble sugars on plantlets of *Pistacia atlantica* Desf. subsp. *atlantica* used as rootstocks. *Biotechnology, Agronomy, Society and Environment, 16*(2), 159-165. Retrieved from http://www.pressesagro.be/base/text/v16n2/159.pdf

Berga, S. L., & Loucks, T. L. (2007). *Stress induced anovulation*. Retrieved from http://booksite.elsevier.com/brochures/stress/PDFs/berga.pdf

Boston Children's Hospital. (2013, August 21). Bacteria make us feel pain ... and suppress our immune response. *ScienceDaily*. Retrieved from www.sciencedaily.com/releases/2013/08/130821132708.htm

Bouchard, J. N., & Yamasaki, H. (2008). Heat stress stimulates nitric oxide production in Symbiodinium microadriaticum: A possible linkage between nitric oxide and the coral

bleaching phenomenon. *Plant and Cell Physiology, 49*(4), 641-652. doi:10.1093/pcp/pcn037. Retrieved from http://pcp.oxfordjournals.org/content/49/4/641.full.pdf

Collin, P., Rosano, G., Casey, C., Daly, C., Gambacciani, M. et al. (2007). Management of cardiovascular risk in the peri-menopausal woman: A consensus statement of European cardiologists and gynaecologists. *European Heart Journal, 28*, 2028-2040. doi:10.1093/eurheartj/ehm296. Retrieved from http://eurheartj.oxfordjournals.org/content/28/16/2028.full.pdf

Consumer Reports Best Buy Drugs. (2008, October). *Evaluating prescription drugs used to treat the symptoms of menopause: Comparing effectiveness, safety, and price*. Retrieved from http://www.consumerreports.org/health/resources/pdf/best-buy-drugs/HormonesUpdate-FINAL-Oct08.pdf

Digre, K. B., Baggaley, S. K., Brennan, K.C., & Jeffries, K. (2011). *Headache*: *A patients guide*. University of Utah Health Care. Retrieved from http://healthcare.utah.edu/neurosciences/pdf/headache_a_patients_guide.pdf

Freedenberg, R. (2009). Naturopathic/holistic treatment of mild to moderate depression. *Natural Medicine Journal, 1*(4), 1-6. Retrieved from http://naturalmedicinejournal.net/pdf/nmj_dec09_tp.pdf

Govindasamy, V., Senthilkumar, M., Kumar, U., & Annapuma, K. (2008). PGPR-Biotechnology for management of abiotic and biotic Stresses in crop plants. In. D. K. Maheshwari & R. C. Dubey, *Potential microorganisms for sustainable agriculture*: *A techno-commercial perspective*. India: I.K. International Publishing House. Available at http://www.academia.edu

Kaye, H. (2010). Headaches. *Natural Medicine, 55*, 81-86. Retrieved from http://hannahkaye.co.za/wp-content/uploads/2010/05/Headaches.pdf

Kuma, V., Abbas, A. K., & Aster, J. C. (2012). Cell injury, cell death, and adaptations. In *Robbins basic pathology* (9th ed.). St. Louis, MO: Elsevier. Retrieved from http://www.eu.elsevierhealth.com/media/us/samplechapters/9781416029731/Chapter%2020.pdf

Life Extension. (2014). *Bacterial infections*. Retrieved from http://www.lef.org/

Liopa-Tsakalidi, A., Zakynthinos, G., Varzakas, T., & Xynias, I. N. (2011). Effect of NaCl and GA3 on seed germination and seedling growth of eleven medicinal and aromatic crops. *Journal of Medicinal Plants Research, 5*(17), 4065-4073. Retrieved from http://www.academicjournals.org/article/article1380714927_Liopa-Tsakalidis%20et%20al.pdf

Lorentz, M. M. (2006). Stress and psychoneuroimmunology revisited: Using mind-body interventions to reduce stress. *Alternative Journal of Nursing*, (11), 1-11. Retrieved from http://www.mm3admin.co.za/documents/docmanager/6e64f7e1-715e-4fd6-8315-424683839664/00025132.pdf

Mager, W. H., de Boer, A. H., Siderius, M. H., & Voss, H-P. (2000). Cellular responses to oxidative and osmotic stress. *Cell Stress Chaperones, 5*(2), 73-75. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC312892/

Majmudar, N. G., Robson, S. C., & Ford, G. A. (2000). Effects of the menopause, gender, and estrogen replacement therapy on vascular nitric oxide activity. *The Journal of Clinical Endocrinology & Metabolism, 85*(4), 1577-1583. Retrieved from http://press.endocrine.org/doi/pdf/10.1210/jcem.85.4.6530

Moberg, G. P. (n.d.). Arriving at a biological definition of stress and distress. *Proceedings for Pain Management and Humane Endpoints*. Retrieved from http://altweb.jhsph.edu/pubs/proceedings/pain/moberg.html

National Institute of Health. (2012, June 27). *Hyperthermia: Too hot for your health*. Available at http://www.nih.gov/news/health/jun2012/nia-27.htm

Noriega, G., Zilli, C., Cruz, D. S., Caggiano, E., Lecube, M. L., Tomaro, M., & Balestrasse, K. Up-regulation of heme oxygenase by nitric oxide and effect of carbon monoxide on soybean plants subjected to salinity. In H. A. El-Shemy, *Soybean Physiology and Biochemistry*, pp. 427-443. Retrieved from http://www.intechopen.com/download/get/type/pdfs/id/22780

Ohio State University. (n.d.). *Agricultural Tailgate Training Safety Modules: Heat stress*. Available at http://ohioline.osu.edu/atts/modules.html

Perimenopause symptoms. (n.d.). Retrieved from http://www.perimenopausesymptoms.org/

Peter, I. (2008, September). Advice for summer headaches. *Neurology News*. Retrieved from http://www.bizcommunity.com/Article/196/349/28565.html

Republic of South Africa. (2009). *Essential oil crops: Production guidelines for lavender*. Department: Agriculture, Forestry and Fisheries. Retrieved from http://www.nda.agric.za/docs/brochures/essoilslavender.pdf

Tiyong Ifoue, S. H., Teugwa Mofor, C., Gouado, I., Teto, G., Asonganyi, T., & Amvam Zollo, P. H. (2009). Evaluation of oxidative stress and antioxidant status of pregnant women suffering from malaria in Cameroon. *Indian Journal of Clinical Biochemistry, 24*(3), 288-293. Retrieved from http://medind.nic.in/iaf/t09/i3/iaft09i3p288.pdf

Truter, I., & Graz, M. (2013). Bacterial vaginosis: Literature review of treatment options with specific emphasis on non-antibiotic treatment. *African Journal of Pharmacy and*

Pharmacology, 7(48), 3060-3067. doi:10.5897/AJPPX2013.0001. Retrieved from http://www.academicjournals.org/article/article1389967189_Truter%20and%20Graz.pdf

Vasisht, K., & Kumar, V. (2004). *Compendium of medicinal and aromatic plants: Africa*. Retrieved from http://institute.unido.org/documents/M8_LearningResources/ICS/80.%20Compendium%20of%20Medicinal%20and%20Aromatic%20Plants-%20Africa%20(vol.%20I).pdf

Yoshikawa, T., & Naito, Y. (2002). What is oxidated stress? *Japan Medical Association Journal, 45*(7), 271-276. Retrieved from http://www.med.or.jp/english/pdf/2002_07/271_276.pdf

Yousef, A. E., & Courtney, P. D. (2002). In basics of stress adaptation and implications in new-generation foods. In A. E. Yousef & V. K. Juneja, *Microbial stress adaptation and food safety*. Boca Raton, FL: CRC Press. Retrieved from http://www.crcnetbase.com/isbn/9781420012828