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Original Article

An exploratory pilot of factors associated with premenstrual syndrome in minority women

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ABSTRACT

Purpose: This investigation explored factors associated with premenstrual syndrome (PMS) in minority women, and compared the response of minority and non-minority women supplemented with omega-3 fatty acids (FA) in the form of fish oil.

Methods: This descriptive, correlational, retrospective pilot was a secondary data analysis. Participants consuming 2 g of fish oil/d ($n = 15$) in the larger study were included. The Moos Menstrual Distress Questionnaire (MMDQ) was assessed monthly for two months to acquire a mean baseline MMDQ score. The total sample was stratified to evaluate racial variations in PMS symptoms (non-minority, $n = 7$; minority, $n = 8$). MMDQ score at 5 months was compared to the mean baseline score within each group.

Results: Fish oil supplementation significantly reduced PMS symptoms in both groups (non-minority $p = 0.002$; minority $p = 0.046$) with a large effect of 1.4 for both groups. Mean MMDQ total scores were not significantly different between groups at 5 months.

Conclusions: This pilot evidence of improved PMS symptoms in minority and non-minority groups related to fish oil supplementation supports a universal treatment approach and highlights need for a larger-scale investigation.

1. Introduction

Premenstrual syndrome (PMS) is a significant health issue for women with a reported prevalence of 47.8% [1]. Premenstrual syndrome can negatively impact a women's life for up to six days monthly. Common symptoms of PMS include, but are not limited to: depression, mood lability, abdominal pain, breast tenderness, headache and fatigue [2]. PMS is associated with increased sick days, impaired work productivity, impaired marital relationships and homemaking difficulties, and impaired functioning [3]. Reduced quality of life has been reported in collegiate women suffering from PMS with decreased educational productivity, disruptions in social activities, and impairments in family relations [4]. Although

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symptoms of PMS impact a large number of women and can be disruptive, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) does not include PMS as an official diagnosis [5].

Evidence is limited regarding differences in PMS symptomatology between minority and non-minority populations. Harlow et al. reported that although European-American women had longer bleeds, African-American women had heavier bleeding episodes compared to European-American women [6]. Additionally, high perceived stress was associated with a 50% increase in heavy bleeding with African American women having significantly higher levels of both. Lastly, African American women have been reported to have an earlier onset of menarche and menopause [6]. Ethnic differences in bleeding duration, volume, perceived stress, and age of menarche provide compelling evidence pointing to differences in uterine and ovarian function, essential to understanding PMS.

Omega-3 fatty acids (FA) offer a promising alternative intervention for alleviating PMS symptoms. Earlier work reported significant correlations have been reported between omega-3 FA supplementation and symptoms of aggression [7], depression [8,9], concentration, and inflammatory disorders [10,11]. Omega-3 supplementation has been reported to improve cognitive performance in healthy subjects [12]. Although the literature is limited regarding the efficacy of omega-3 fatty acids in alleviating PMS symptoms, existing evidence supports this relationship [13,14].

Omega-3 FA's regulate neural membrane conduction and can alter the brain's neurochemical profile including serotonin, dopamine, GABA, and acetylcholine [15]. Enhanced neurotransmission offers a plausible explanation for mood elevation [8,9], a primary symptom of PMS. Inflammation may also be mitigated by omega-3 FA [10,11].

Very few investigations have evaluated the complex array of lifestyle and other factors likely to influence PMS severity. Factors including stress [16,17], exercise habits [17,18], sleep quality [19], caffeine intake [17] and body mass index (BMI) [17,20] have been evaluated previously related to PMS symptomatology and evidence is largely inconclusive to date. Further, factors including credit load, work in addition to coursework, living situation and marital status are likely to contribute to perceived stress level in collegiate women however, these factors remain unexplored. Further research is necessary exploring the influence of various factors on PMS symptom severity and expanding the current literature. Understanding the influence of various factors on PMS symptom severity is highly important for the development of intervention strategies in women suffering from PMS.

Given that PMS symptomatology includes depression, difficulty concentrating, emotional lability, abdominal and breast pain, headache and fatigue, omega-3 FA may offer a promising alternative intervention in alleviating mood and inflammatory disturbances [5–10]. This investigation aimed to explore factors impacting PMS symptomatology in minority women, and compare the response of minority women to supplementation with omega-3 FA with a non-minority cohort.

2. Materials and methods

This descriptive correlational retrospective pilot was a secondary data analysis of data from a previous double blind placebo controlled study. The focus of this analysis was to explore factors associated with PMS in minority women, and compare the response of minority and non-minority women to supplementation with omega-3 FA. All participants in the secondary analysis (n = 15) consumed 2 g of fish oil daily for 3 months following the protocol of the original investigation (Fig. 1.)

In the original investigation, there was and intervention group (omega-3) and a placebo group. The intervention group was given omega-3 fatty acid as 2 g fish oil, while the placebo was given 2 g of wheat germ oil. The groups were randomized using a computerized randomization program and a master's level nursing student who is in no way associated with the study prepared the packages for each participant. Packets contained a three month supply of capsules and each packet was identical without information that would identify capsule type and group assignment. Study numbers were marked on the exterior of each packet contained information regarding capsule storage, initiation and intake recording.

2.1. *Participants*

Recruitment was conducted in accordance with the IRB at the University of Connecticut. Participants were collegiate female women age 18–25. Once consented, a medical history form was completed by those interested in participating in the investigation. The medical history form was a self-report of menstrual, medical, social history and demographic information. Participants were deemed eligible if they met the PMS symptomatology profile and not the exclusionary criterion. The exclusionary criterion included: diabetes, hypercholesterolemia, hyperlipidemia, hypertension, anticoagulants (ex: low dose aspirin, Warfarin, Coumadin), renal or liver disease, pregnant or planning on becoming pregnant, diagnosed with

Fig. 1 – Supplementation timeline: Baseline monitoring for 2 months with supplementation at months 3–5.