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Original Article

Pilot trial evaluating maternal docosahexaenoic acid consumption during pregnancy: Decreased postpartum depressive symptomatology

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ABSTRACT

Objective: Docosahexaenoic acid (DHA, 22:6, n-3) is a major structural component of neural tissue critical to neurotransmission and mood regulation. Poor maternal dietary intake coupled with accelerated maternal-fetal transfer of DHA compound risk for maternal deficiency. The objective of this investigation was to determine if maternal DHA supplementation is efficacious in reducing symptoms of postpartum depression.

Methods: This pilot investigation was a randomized, double-blinded, placebo controlled investigation of the role of DHA in preventing risk for postpartum depression. Women were assigned to: i) Placebo (no DHA, corn oil capsule), ii) DHA (300 mg DHA, fish oil capsule). Capsules were consumed from 24 to 40 weeks gestation (1 capsule 5 days/week). Forty-two participants were recruited ($n = 20$, intervention; $n = 22$, placebo). Maternal DHA status and depressive symptoms were followed from 24 to 40 weeks gestation using the Center for Epidemiologic Studies Depression Scale (CES-D) and the Postpartum Depression Screening Scale (PDSS) from 2 weeks to 6 months postpartum.

Results: PDSS total scores were significantly lower ($p = 0.016$; 46.03 ± 2.17, intervention vs. 52.11 ± 2.4, placebo) in the intervention group with less anxiety/insecurity ($p = 0.03$), emotional lability ($p = 0.04$) and loss of self ($p = 0.02$).

Conclusions: Women in the DHA intervention group had fewer symptoms of postpartum depression compared to the placebo group. These results support the notion that the consumption of DHA by pregnant women can be efficacious in preventing depressive symptoms and highlight a need for further larger-scale investigations using the PDSS in tandem with a diagnostic evaluation.

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1. Introduction

Postpartum depression, the most common complication of childbirth, is a major public health problem [1], affecting 13–15% of pregnant women in the U.S. [2]. Further, 25–50% of women diagnosed with postpartum depression have episodic events for up to six months or more [3]. Postpartum depression is a universal phenomenon, affecting women in countries throughout the world [4] and suffered covertly [5]. Because postpartum depression is a term applied to a wide range of postpartum emotional disorders, women may be misdiagnosed. Current DSM-IV-TR guidelines [6] outline that, in addition to depressed mood or loss of interest or pleasure in activities, women need to have three or more other symptoms including insomnia, psychomotor agitation or retardation, fatigue, feelings of worthlessness or excessive or inappropriate guilt, inability to concentrate, or suicidal thoughts. The importance of preventing, diagnosing, and treating postpartum depression is underscored by the findings that postpartum depression has significant adverse effects on children's cognitive and emotional development [7,8]. The evidence for a demonstrated benefit of fish/seafood and n-3 long chain fatty acids (n-3 LCPUFAs) in preventing or decreasing symptomatology of postpartum depression is mixed [9–12]. Given the teratogenic effects of some medications traditionally used to treat depressive disorders, there is the need to explore possible alternative treatments or augmentation to traditional medical treatments for women with depression associated with pregnancy. N-3 LCPUFAs present a possible treatment or adjuvant to treatment for this disorder.

Given the collective evidence we report, the major hypothesis for this investigation was: Women who consume fish oil during pregnancy will have lower postpartum depressive symptomatology measured using the PDSS (total score and individual symptom domains) compared to the placebo group. In the current study we employed the Postpartum Depression Screening Scale (PDSS) to evaluate if pregnant women who consumed fish oil capsules had decreased postpartum depressive symptoms compared to women consuming a placebo.

2. Material and methods

2.1. Research design

This pilot investigation was a double-blind, randomized, control trial, with repeated measures of the primary investigative outcome of maternal postpartum depressive symptomatology at 2 and 6 weeks, and 3 and 6 months postpartum. All participants consumed one capsule (intervention: fish oil with 300 mg docosahexaenoic acid [DHA, 22:6, n-3] per capsule; placebo: corn oil) 5 days weekly. Participants were assigned randomly to either intervention ($n = 20$) or placebo ($n = 22$), and consumed capsules from 24 weeks gestation until delivery. All study procedures were approved by the University of Connecticut and Louisiana State University and in accordance with the Code of Ethics of the World Medical Association.

2.2. Sample/setting

Forty-two maternal-infant dyads completed the investigation. Inclusion criteria were: No other births in the previous two years; ≤20 weeks pregnant; and 18–35 years of age. Women with a self-reported significant medical history were excluded (i.e., currently being treated for depression/psychiatric illness, addiction problems, hyperlipidemia, hypertension, renal disease, liver disease, or diabetes). Recruitment of participants was conducted in collaboration with several Women Infants and Children (WIC) offices and hospitals in New England.

Determination of sample size for a full-scale investigation was based upon a previous investigation comparing rates of postpartum depression with respect to seafood consumption [9]. The sample in this pilot investigation ($n = 42$) is 78% of the minimum calculated to be necessary for a full-scale investigation (effect size based upon a power of 0.8, significance level of 0.05).

All participants were randomized utilizing a coded marble system and assigned to groups by a trained individual who was not a research team member. Packages containing capsules were labeled identically and listed only sequential study

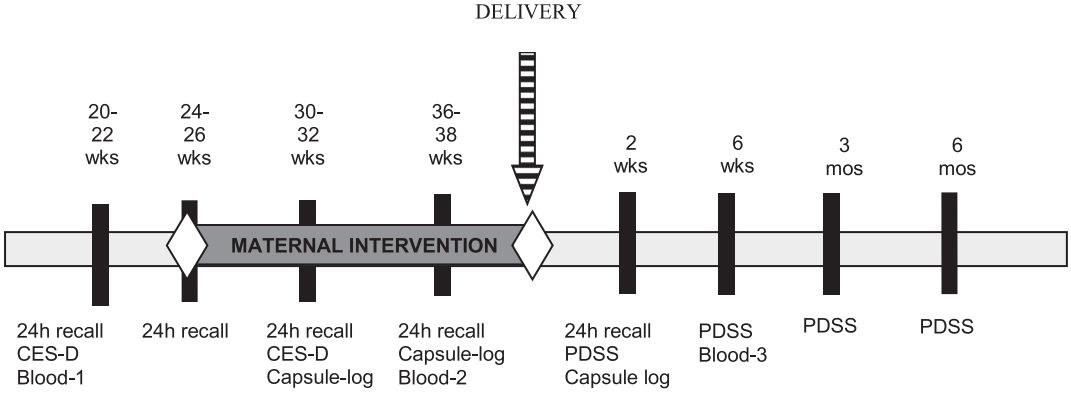

Fig. 1 – Schedule of intervention & sampling. 24 h recall: 24 h dietary recall; CES-D: Center for Epidemiologic Studies Depression Scale; Blood (1–3): Fasting maternal blood draw; Capsule log; PDSS: Postpartum Depression Screening Scale.