



Brief report

Serum cholesterol concentration and distress in the initial days after childbirth

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Abstract

The link between mood disorders and cholesterol is characterized by some contradictory data. In particular, it is not clear whether health factors are responsible for lowered cholesterol levels and mood swings. The present study tests the association between serum cholesterol level and psychological distress in women in two different post-delivery hospital settings: rooming-in (RI) and no rooming-in (no-RI). On day 3 after childbirth, 147 RI and 209 no-RI women completed the Kellner Symptom Questionnaire (SQ), which evaluates anxiety, depression, somatic symptoms and hostility. Plasma cholesterol concentration was measured on the same day. There was a significant negative correlation between cholesterol and depressive symptoms in no-RI women, but not in the RI group. However, this correlation is characterized by an extremely small effect size (-0.15). The findings of this study cast further doubt on the hypothesis of a possible association between cholesterol and depression in the general population and in mothers who have just given birth.

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1. Introduction

In recent years many studies have shown an association between serum cholesterol levels and a variety of psychological and behavioral variables, including personality, suicide, violence, mood disorders, and schizophrenia (Boston et al., 1996; Golomb, 1998; Papakostas et al., 2004). However, doubts have been raised about the

relationship between low cholesterol and risk of death due to injuries or suicide, major depression or depressive symptoms, and anxiety disorders (Huang et al., 2003). In particular, recent evidence has indicated that cholesterol levels do not appear to be an appropriate biological marker for suicide during the first 4 weeks of treatment in patients with a major depressive episode (Deisenhammer et al., 2004). Moreover, the association between low cholesterol level and suicidal behavior is present only in women (Guillem et al., 2002), and the association between low cholesterol and impulsivity is much less evident in healthy young men than in a selected clinical sample of psychiatric patients with impulse-control disorders (Pozzi et al., 2003).

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To address the limitations of using total cholesterol as a single measure, some authors sought additional markers by using simultaneously specific biochemical measurements and psychiatric interviews. From this orientation, Huang et al. (2003) found significant differences in high-density lipoprotein cholesterol concentrations and the ratios of total cholesterol/high-density lipoprotein and low-density lipoprotein/high-density lipoprotein (atherogenic index) among anxious state, depressive state and normal groups in men after age adjustment.

In perinatal psychiatry, an interesting debate has emerged on the possible relationship between serum cholesterol level and puerperal mood disorders, with the suggestion that measuring blood cholesterol levels immediately after delivery might offer a screening tool for maternity blues and postnatal depression.

It has been demonstrated that a decreased level of serum cholesterol is associated with depressed mood and greater feelings of fatigue in the days following childbirth (Ploekinger et al., 1996; Nasta et al., 2002). However, these results have not been entirely confirmed by measures taken in the weeks after childbirth. In fact, some authors (Troisi et al., 2002) have shown that lowered postpartum levels of total cholesterol may be associated with symptoms of anxiety, anger/hostility and depression. In other researches (van Dam et al., 1999), it emerges instead that rapid serum cholesterol decline does not seem to increase the risk of postpartum depression.

In the literature, the current theory is that a lowered serum cholesterol level reduces the activity of the central serotonergic structures responsible for inhibiting impulsive behavior (Ainley et al. and Rybakowsky, 1996), increasing the risk of depression. However, it is not yet clear whether a) low cholesterol causes depression and psychological distress or b) other health factors are responsible for both lowered cholesterol and mood swings.

The purpose of this study was 1) to test the association between serum cholesterol level and psychological and somatic maternal symptoms in the first days after childbirth, and 2) to investigate whether the choice of different post-delivery hospital settings influenced the link between cholesterol and psychological distress in women. Psychological distress and serum cholesterol concentrations in two groups of primipara mothers were therefore measured in the first days after childbirth.

2. Methods

At the University Hospital of Padua, mothers may choose between rooming-in (RI) or traditional after-delivery nursing care (no-RI). In the RI setting, newborns are placed in a crib at the mother's bedside, and the mother

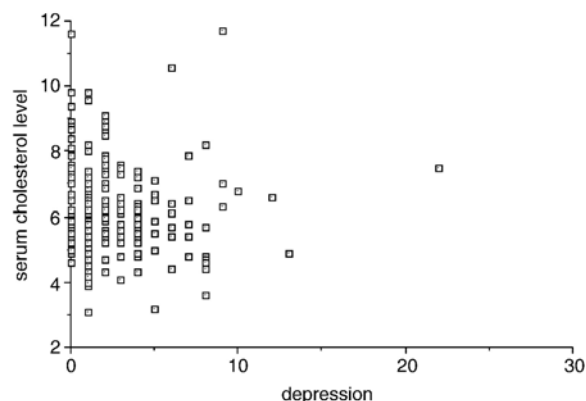


Fig. 1. Correlation between serum cholesterol and depression in the no-RI group.

is encouraged to care for her infant. In the no-RI setting, the mother is separated from the baby soon after birth, with the baby being placed in a separate nursery and brought to the mother at designated times. We studied a total sample of 356 healthy primipara volunteers, comprising a random group of 147 RI women and a second random group of 209 no-RI mothers.

All the women were married, 25 to 41 years of age, primigravida, with normal labor (mean length = 6 ± 1 h) and normal delivery, a healthy living child, and of a medium-to-high socio-educational level as assessed by standard questions (years of education = 15 ± 3).

On day 3 postpartum (mean = 68 h), all subjects completed the Kellner Symptom Questionnaire SQ (Kellner, 1987). Absolute serum cholesterol concentrations were measured the same day, using the enzymatic colorimetric test (Warnick, 1986).

The SQ is a self-evaluation instrument that is oriented toward the discovery of symptoms and comprises the following four principal scales: anxiety, depression, somatic symptoms and hostility. Each of the scales contains 23 items; a high score corresponds to high psychological suffering, whereas a lower score indicates a low degree of suffering. The psychometric characteristics of the SQ do not permit recording after the birth of the child, the presence or absence of maternity blues or postnatal depression.

The sensitivity of the enzymatic colorimetric test is 0.08 mmol/l, which represents the lowest concentration of cholesterol that can be distinguished from zero. The normal range was determined to be 2.0–5.2 mmol/l. The level of significance was set at $P=0.05$.

3. Results

Data were analyzed using SPSS 11.5 for Windows. Descriptive statistics were used to investigate serum

Table 1
Means and standard deviations in serum cholesterol level and SQ scales

	RI group (<i>n</i> = 147)		No-RI group (<i>n</i> = 209)	
	Mean	S.D.	Mean	S.D.
Serum cholesterol (mmol/l)	6.5	1.3	6.3	1.4
1. Anxiety	4	4.2	4.6	4.3
2. Depression	2.4	2.9	2.5	2.8
3. Somatic symptoms	7	3.8	7.1	3.9
4. Hostility	1.2	2.5	1.2	2.4

In each individual SQ scale, the score ranges from 0 to 23. The normal range of absolute serum cholesterol concentrations is 2.0–5.2 mmol/l.

cholesterol levels and SQ scale scores. An initial analysis of the data shows that subjects' scores in the single SQ scale are not normally distributed normally. Therefore, Spearman correlation co-efficient two-sided *P*-values were sought between absolute lipid concentrations for each subject and symptom scores obtained on each of the four scales of the SQ (1. anxiety; 2. depression; 3. somatic symptoms; and 4. hostility). The results show a significant negative correlation between serum cholesterol and depression in the no-RI group ($\rho = -0.15$; $P < 0.05$) (see Fig. 1). There are no significant correlations between serum cholesterol and the other SQ scales for either the RI or the no-RI group. Table 1 reports the means and standard deviations obtained for the two groups of women for the serum cholesterol level in each SQ scale.

Finally, two analyses of variance (ANOVAs) were computed to compare cholesterol levels and SQ scale scores in the RI and no-RI mothers. No significant differences emerged between the two groups of women.

4. Discussion

The results of our study show a significant correlation between cholesterol levels and symptoms of depression. However, this correlation emerges only in women in the no-RI hospital setting and is characterized by an extremely small effect size. In particular, for women who choose to spend most of their time with the newborn after birth, a significant association between low cholesterol level and high depressive symptomatology is in fact absent, and vice versa.

Therefore these data indicate that in primipara women with low social and medical risk the link between cholesterol and mood assumes diversified characteristics. In fact, in the first few days after delivery, the choice of a limited versus a prolonged contact with the child and specific care experiences show a differential pattern of correlation with cholesterol levels and the symptoms of depression.

It is possible that the RI and the no-RI conditions in the hospital activate in the woman a sense of nurturing as well as psychobiological elements that may influence the nervous system, endocrine system activity and lipid concentration in the body to various degrees. In other words, it is possible that the attitudes toward the child of women who choose the RI setting influence, to varying degrees, some physiological mechanisms and neuroendocrine maternal reactions typical of the afterbirth (Fleming and Corter, 1988; Fleming, 1989), and directly or indirectly the concentration of cholesterol serum levels.

It is also probable, however, that the particular RI context of the hospital, comparable to that of a therapeutic community (Jones, 1961), may have influenced, not only the mental state of the women but also their SQ performance. It may be speculated that in some clinical conditions, such as RI and no-RI, specific factors and/or elements, as yet unknown, may affect the link between lipids and mood, resulting in varying levels of correlation between cholesterol and depressive symptomatology after the birth of the child.

The relationship, if any, between lower total cholesterol levels and the presence mood disturbances is still uncertain (Huang et al., 2003), and the findings of the present research cast further doubt on the hypothesis of a specific association between lipids and depression in the postnatal period.

In this regard, it is important to emphasize that in the literature many studies on the relation between depression and cholesterol have involved psychiatric patients and subjects with clinical dysfunctions or known problems as subjects. The women in our research were instead healthy, married and of a medium–high socio-educational level. It is therefore necessary, on one hand, to study further whether some psychosocial and clinical factors influence the correlation between lipids and mood, and on the other hand, to investigate if the relationship actually involves cholesterol derivatives (e.g., oestrogen, aldosterone and progesterone).

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