Reviewing the Relationship between Cholesterol and Suicide

May 15, 2013

Statement of the Problem

Identifying biological markers that may provide insight into suicide risk is highly valued and needed. Is there a relationship between cholesterol and suicide risk?

Summary of the relevant literature

Research looking at cholesterol and its relationship to suicide stemmed from the increase in suicide and injuries following the use of a cholesterol lowering drug (Penttinen et al. 1995; Hibbeln, et al. 1996). Since then numerous studies have evaluated this relationship, and mixed results have been reported.

Early studies surrounding the initial observation found supporting evidence that there is a relationship between suicide and cholesterol. With a few exceptions (Chang et al. 2012; Brunner et al. 2002), the majority of the studies has found that lower, as compared to higher, cholesterol is significantly associated with increased suicidality (Sarchiapone et al., 2001; Atmaca et al. 2002; Sullivan et al. 1994). More specifically, a link between depression, lower cholesterol, and suicide was found. This relationship was initially found by Sullivan and colleagues who looked at 90 men and women and discovered that those with depression and lower cholesterol levels had an increased risk of suicide, compared to those with depression and average cholesterol levels (1994). Multiple studies since then have supported this relationship (Kunugi et al., 1997; Papassotriopoulos et al., 1999; Rabe-Jablonka et al., 2000; Kim et al., 2004; Ruljancic et al., 2011). More recently, Olie and colleagues were able to corroborate this finding as well as gain insight into possible gender differences. Their study revealed that the risk of suicide attempts increased 15.6 fold in women with lower cholesterol compared to 7.33 fold in men (Ellison et al., 2001; Olie et al., 2011). Even though Olie found that women may be at higher risk, research supports that both men and women with lower cholesterol may experience increased suicidality (Zhang et al., 2005; Marcinko et al., 2007; Jokinen et al., 2010; Olie et al., 2011). Additionally, it is important to note that lower cholesterol levels have been found to be associated with lifetime suicide attempts (Alvarez et al., 1999; Brunner et al., 2006).

Despite the evidence mentioned above more recent research casts doubt on whether the relationship actually exists. In more recent years, research in this area has emerged disproving previous study conclusions (Almeida- Montes et al., 2000; &Tsai et al., 2002). A retrospective study conducted on psychiatric inpatients did not find a significant difference in the cholesterol levels between patients who had attempted suicide and those who had not (Huang et al., 2001). Other studies that examined depression and its association to lower cholesterol and suicide reported no significant association between those variables (Deisenhammer et al., 2004; Haung et al., 2005; D’Ambrosio et al., 2012; Persons, 2012). The lack of association was also confirmed in a small study of suicidal borderline personality disorder patients who showed no cholesterol level differences (Marcinko et al., 2011). Lastly it is important to note that not only were findings unsupported but contradicted. In 2011 de Leon and colleagues evaluated 193 current
suicide attempters and found that lower cholesterol levels were not associated with increased suicide risk but with a decreased risk in men.

**Gaps in the literature**

Even though more studies support the claim that a relationship does exist, a clear conclusion cannot be determined. After conducting a review, De Berardis and colleagues identified potential problems and gaps that may have been overlooked. One possible problem could be the accuracy and precision of measures and study designs used in early findings supporting the relationship between cholesterol and suicide (De Beradis et al., 2012). Additionally, Pearson argues that in previous findings cholesterol was examined as a whole instead of looking at its parts, HDL-c and LDL-c, and that this may have played a role in the perceived relationship (2012). Lastly, change in cholesterol may be shared by other clinical conditions making it hard to clearly determine the relationship with suicidality (De Berardis et al., 2012).

**Recommendation(s)**

- More longitudinal designs with larger samples
- More detailed look at the break down of cholesterol
- Need to eliminate confounding variables (which may be challenging)

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**References**


Marčinko, D., Bilić, V., & Pivac, N. (2011). Serum cholesterol concentration and structured individual psychoanalytic psychotherapy in suicidal and non-suicidal male patients


