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Serum Lipids and Suicidality in Early Psychosis: Is There a Connection? A Preliminary Study

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Serum Lipids and Suicidality in Early Psychosis: Is there a connection? A preliminary study

Amresh Shrivastava ¹, Megan Johnston²
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Suicide is an international mental health problem

Canada: 3200 per year \(^1\)

10% of all suicide patients - Schizophrenia

1. Statistics Canada, 2009
50% of persons who have committed suicide sought professional help within 1 month of the act (Lester 1993)

>90% people who attempt suicide have a mental disorder:

World Health Organization

Schizophrenia

- 10-13% die, in follow up\(^1\)
- 4.9% in recent meta-analysis
- Life time risk of 4%
- The annual rate of 0.4% to 0.8%
- Has remained constant \(^2\)

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First episode or early phase of psychosis: High risk phase

- Died (06)
- Attempted prior to entry (93)
- Attempted during treatment (57)

FES, N=661


Predicting suicidal behavior is a complex and difficult task.\(^1\)

Predictive models generally have not proven accurate or sensitive enough to have practical clinical value (Mann, 2001).

Several factors have some predictability.

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Serotonin – Biology

- Central Serotonin: central modulator.
- Low 5-HT/ 5-HIAA hostile aggression.
- Serotonin transporters
- DST: Non suppression
- Prolactin
- PFC and cingulate gyrus
- Both: Attempted and completed suicide

Can we easily measure it?
Can it help in prediction?

Cholesterol

- plays an important role in distinguishing suicidal from non-suicidal patients\(^1\)
- Lower level of cholesterol is associated with
  - suicide behavior
  - violent suicide
- Studies of postmortem brain of suicide completers in psychosis \(^2,^3\)

**Serum cholesterol**

- Central cholesterol - key player in serotonin metabolism
  - It plays a fundamental role in maintaining the soundness of neuron membranes
  - Especially in the transport of serotonin vesicles into the synaptic cleft
- The relationships among suicidality, psychosis and cholesterol remain undetermined and complex

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Synthesis

Cholesterol

Metabolism

TGL

Lipoproteins

Food

Internal Phosphates etc

Synthesis

Cholesterol

Metabolism

TGL

Lipoproteins

Slow movement of vesicles

Low serotonin in synaptic cleft

• Depression
• Impulse dyscontrol
• Violence
• Aggression
• Suicide

Hypothesis

- High SIS-MAP, Current suicidality
- Cholesterol

Suicide attempt

Study
Objective

(a) To determine relationship of cholesterol with clinical parameters and level of suicidality
(b) correlation of suicide potential of SIS-MAP scale

Two phase study:
1. Pilot, cross-sectional cohort design to test the correlations of two parameters
2. Longitudinal follow up study, to test the predictability
Methods:

Preliminary, Naturalistic, cohort

- Subjects (patients) must be 18+ years of age.
- DSM IV criterion of ‘Non-affective schizophrenia spectrum’
- First episode psychosis can be continuous or exacerbating
- Excluded: OMD, Withdrawal states, Physical illness, chronic pain with opiates
Assessment

- Clinical data
- Psychopathology: PANSS & HDRS
- Suicidality by SIS-MAP scale
- Serum cholesterol: From database
- All assessment with 7 days of admission or consult
- Semi-structured
- Analyzed: SPSS
SIS-MAP

Clinical Cut-Offs for Level of Care Needed

Scores 13-23 = outpatient follow-up highly recommended

Scores >33 = admit highly recommended

Scores 23-33 = consider psychosis, previous suicide attempts, and protective factors
Results

Sample
- 41 males (68.3%), 19 females (31.7%)
- age mean (years) = 26.5 (SD = 4.61); range = 17 – 38
- duration of illness mean (months) = 14.6 (SD = 9.71); range = 3 – 38
Range of Suicidality
SIS-MAP scores (frequency/percent of participants in each category of Suicidality)

- Low suicidality, SISMAP (0-18)
- Moderate Suicidality, SISMAP (19-29)
- High Suicidality (>30)
Cholesterol: Comparison across suicidality

Tendency for lower cholesterol levels to be associated with higher suicidality $F(2,1) = 2.86, p = 0.066$

<table>
<thead>
<tr>
<th>SISMAP</th>
<th>Cholesterol Mean</th>
<th>N</th>
<th>Std. Deviation</th>
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</thead>
<tbody>
<tr>
<td>low</td>
<td>4.120</td>
<td>20</td>
<td>1.3217</td>
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<tr>
<td>moderate</td>
<td>3.319</td>
<td>14</td>
<td>1.6396</td>
</tr>
<tr>
<td>high</td>
<td>3.488</td>
<td>26</td>
<td>1.3860</td>
</tr>
<tr>
<td>Total</td>
<td>3.660</td>
<td>60</td>
<td>1.4426</td>
</tr>
</tbody>
</table>
Results: Cholesterol

- **range** = 0.3 to 6.7; **mean** = 3.66 (SD = 1.44)
- Cholesterol means value for each category of suicidality

**Mean Cholesterol**

Lower cholesterol levels related to higher suicidality $F(2,1) = 2.86, p = 0.066$

<table>
<thead>
<tr>
<th>SISMAP</th>
<th>Low</th>
<th>Moderate</th>
<th>High SISMAP</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>20</td>
<td>14</td>
<td>26</td>
<td>60</td>
</tr>
</tbody>
</table>
Associations of Suicidality and Gender with Cholesterol Levels

Analysis of Variance (ANOVA) with cholesterol scores as outcome

Suicidality approaches significance in the prediction of cholesterol scores

Also, there is a significant gender difference by suicidality interaction

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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<tbody>
<tr>
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<td>3.845</td>
<td>2.005</td>
<td>.093</td>
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<tr>
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<td>272.981</td>
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<tr>
<td>SISMAP</td>
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<td>2.860</td>
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<tr>
<td>Sex * SISMAP</td>
<td>12.448</td>
<td>2</td>
<td>6.224</td>
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<tr>
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<td>54</td>
<td>1.918</td>
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<td></td>
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<tr>
<td>Total</td>
<td>926.303</td>
<td>60</td>
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<td></td>
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<tr>
<td>Corrected Total</td>
<td>122.786</td>
<td>59</td>
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</tr>
</tbody>
</table>
Gender Difference in Suicidality and Cholesterol

Higher suicidality in males related to lower cholesterol, whereas moderate suicidality in females is related to the lowest cholesterol levels

\( (F (2,1) = 3.245, p = 0.047) \)
Conclusion:

- The study shows that serum cholesterol does not show any abnormality in early psychosis admitted patients as a group.

- However, lower levels are observed in patients of psychosis with severe suicidality.

- More research is required in this field to determine the neurochemistry of suicide behavior in psychosis.
Thank you

‘Care needs to reach where people live, where problems arise’