Perinatal psychiatry
How biology and the environment interact with brain vulnerability to trigger puerperal psychosis

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Institute of Psychiatry, Psychology & Neuroscience

19th century
Carl Fuestner (1848–1906): First reference in German psychiatry to postpartum psychoses:
A disturbance of blood circulation.

Victorian England: severe, dangerous, threat to the sanctity of the Victorian home (it challenged ideals of motherhood):
Little medical intervention; explained according to female vulnerability and biology, in moral, social and environmental frameworks

Emil Kraepelin (1856–1926):
Dichotomous classification of schizophrenia and affective disorders

What is Postpartum Psychosis?
• Most severe postnatal mental illness
• Rapid onset - often within 1 week after delivery
• Marked change from the woman’s previous level of functioning
• Mood lability, hallucinations and delusions - often centered on the baby, confused thinking and grossly disorganized behaviour, insomnia

Rates
1-2/1000 deliveries
Increased risk (up to 50%) for women with a diagnosis of Bipolar Disorder, Schizoaffective Disorder or Personal Hx. of PP

The Last Therapeutic Orphan: The Pregnant Woman
Wisner, AJP 2012

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Rates
1-2/1000 deliveries
Increased risk (up to 50%) for women with a diagnosis of Bipolar Disorder, Schizoaffective Disorder or Personal Hx. of PP
• It occurs after an important biological change (rapid onset following delivery suggests extreme hormonal fluctuations are a factor)

• The risk is very high in women with bipolar disorder, schizoaffective disorder, or previous PP

Most biological research on PP has focused on genetic risk factors

• Multiple risk and protective factors
• Multiple biological systems

1. Risk factors for PP
2. Mother-infant relationship in women at risk of PP
3. Infant development in women at risk of PP
**Recruitment**

<table>
<thead>
<tr>
<th>Pregnancy</th>
<th>Birth</th>
<th>Postnatal period</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 weeks</td>
<td>32 weeks</td>
<td>6 days</td>
</tr>
</tbody>
</table>

**PERINATAL PSYCHIATRY SERVICES**
- Women at risk of PP

**GENERAL ANTENATAL SERVICES**
- Healthy women

**Our model**

**Results**

**SYMPTOMS**

<table>
<thead>
<tr>
<th>Depression</th>
<th>Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy women</td>
<td><strong>p&lt;0.01</strong></td>
</tr>
<tr>
<td>Women at risk of PP</td>
<td></td>
</tr>
</tbody>
</table>
Clinical symptoms in first week after delivery

Manic symptoms

Psychotic symptoms

Women unwell at 8 weeks

<table>
<thead>
<tr>
<th>Unwell at 8 weeks</th>
<th>Percentage</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>36.4</td>
<td>12</td>
</tr>
<tr>
<td>Manic episode</td>
<td>15.2</td>
<td>5</td>
</tr>
<tr>
<td>Depressive episode</td>
<td>21.2</td>
<td>7</td>
</tr>
<tr>
<td>No</td>
<td>63.6</td>
<td>21</td>
</tr>
</tbody>
</table>

Women who relapsed at 12 months

<table>
<thead>
<tr>
<th>Unwell at 12 months</th>
<th>Percentage</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>47.2</td>
<td>10</td>
</tr>
<tr>
<td>Manic episode</td>
<td>14.3</td>
<td>3</td>
</tr>
<tr>
<td>Depressive episode</td>
<td>28.6</td>
<td>7</td>
</tr>
<tr>
<td>Other episode</td>
<td>4.7</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>52.4</td>
<td>11</td>
</tr>
</tbody>
</table>

Stress and stress hormones may affect the brain
Maternal childhood maltreatment
(Childhood Experiences of Care and Abuse Questionnaire)

Results

\[ p < .01 \]

Hazelgrove, In preparation

Maternal Stress during Pregnancy

\[ * P < 0.01 \]

Maternal Stress during Pregnancy & Symptoms after the Birth

Activation of the immune system
Cortisol response

Brain structure and risk of psychosis

In Bipolar Disorder:
Smaller anterior cingulate cortex and amygdala

In individuals at risk of psychosis who develop psychosis:
Smaller temporal, inferior and superior frontal cortex and postcentral gyrus
Smaller subgenual cingulate cortex in those who develop affective psychosis
In progress: Emotion recognition

Maternal ability to recognize emotions

During pregnancy and at 8-12 weeks:
Vienna Emotion Recognition Task (VERT-K)

Brain activation during emotion processing

1st Task
- Examples of baby and adult faces (neutral, sad and happy)

2nd Task
- Examples of adult faces (fearful)

Psychiatry Research And Motherhood - Psychosis (PRAM-P) Study

Lawrence et al, In preparation
Risk factors for the mother-infant relationship:

- Maternal mental illness
- Maternal history of childhood trauma/negative experiences with caregivers
- Domestic violence
- Low socio-economic status (poverty, social disadvantage)
- Maternal substance misuse
- Preterm delivery and other pregnancy/delivery complications
- Others

Mother-infant relationship  Long term infant development

Maternal antenatal attachment towards the foetus (Maternal Antenatal Attachment Scale)

<table>
<thead>
<tr>
<th>Quality of Attachment</th>
<th>Preoccupation (Time spent in attachment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>** p&lt;0.01</td>
</tr>
<tr>
<td>Ambivalent/Detached</td>
<td></td>
</tr>
</tbody>
</table>

Maternal postnatal attachment towards the infant (Maternal Postnatal Attachment Scale)

<table>
<thead>
<tr>
<th>Quality of Attachment</th>
<th>Pleasure in interaction</th>
<th>Absence of hostility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>** p&lt;0.01</td>
<td></td>
</tr>
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<td></td>
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</table>

Biaggi et al. in preparation
Antenatal attachment and clinical symptoms in women at risk of PP

Quality of Antenatal attachment and symptoms

<table>
<thead>
<tr>
<th>Anxiety (n=26)</th>
<th>Depressive Symptoms (n=27)</th>
<th>Manic Symptoms (n=27)</th>
<th>Psychotic Symptoms (n=21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Week before delivery</td>
<td>Week after delivery</td>
<td>Week before delivery</td>
</tr>
<tr>
<td>-0.48</td>
<td>-0.34</td>
<td>-0.41</td>
<td>-0.45</td>
</tr>
<tr>
<td>Week after delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.01</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Correlations with Quality of attachment  * p < 0.05  ** p < 0.01

Infant behaviour (NBAS) at 6 days

Neonatal Behavioural Assessment Scale (NBAS):
- Social Interactive
- Range of States
- Regulation of States
- Motor
- Autonomic stability

Infant behaviour (NBAS) at 6 days

<table>
<thead>
<tr>
<th></th>
<th>Infants born to women at risk of PP (n = 38)</th>
<th>Infants born to healthy women (n = 53)</th>
<th>U</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Interactive Cluster</td>
<td>6.5 ± 1.5</td>
<td>7.0 ± 1.4</td>
<td>761.5</td>
<td>0.048*</td>
</tr>
<tr>
<td>Range of State Cluster</td>
<td>3.5 ± 0.8</td>
<td>3.6 ± 0.7</td>
<td>976.9</td>
<td>0.805</td>
</tr>
<tr>
<td>Regulation of States Cluster</td>
<td>5.7 ± 1.3</td>
<td>6.2 ± 1.3</td>
<td>848.5</td>
<td>0.201</td>
</tr>
<tr>
<td>Motor Cluster</td>
<td>5.2 ± 1.0</td>
<td>5.5 ± 0.7</td>
<td>822.5</td>
<td>0.136</td>
</tr>
<tr>
<td>Autonomic Stability Cluster</td>
<td>5.2 ± 1.4</td>
<td>5.8 ± 1.1</td>
<td>719.0</td>
<td>0.020*</td>
</tr>
</tbody>
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* p < 0.05
Maternal Stress during Pregnancy & Autonomic stability

Infant development (Bayley) at 12 months

Bayley Scales of Infant and Toddler Development (BAYLEY-III)

- Cognitive
- Language
- Motor
- Social-Emotional
- Adaptive Behaviour

Infants born to women at risk of PP (n = 22)

<table>
<thead>
<tr>
<th></th>
<th>Infants born to healthy women (n = 33)</th>
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<tr>
<td></td>
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<tr>
<td>Cognitive development</td>
<td>105.7</td>
</tr>
<tr>
<td>Language development</td>
<td>89.4</td>
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<td>Motor development</td>
<td>94.2</td>
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** p < 0.01

Women at risk of PP:
- Neurobiological risk factors similar to those of other psychoses
- Higher levels of childhood maltreatment
- Higher preoccupation towards their babies in pregnancy and more negative affective experience in the postpartum period
- More clinical symptoms in the early postpartum
- Lower quality of attachment with increased symptomatology around delivery
- Infants with less optimal behavioural and developmental outcomes
The study is funded by NARSAD, MRC/Medical Research Foundation (MRF)

THANKS TO.....
Carmine M Pariante
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Steve Williams

Thanks to perinatal teams across London and most of all to the women who shared their early lives as mothers with us.

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Results

### Percentage of women on medication at 8 weeks

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<tr>
<th>Medication at 8 weeks</th>
<th>Percentage</th>
<th>Number</th>
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<tbody>
<tr>
<td>Yes</td>
<td>81.8</td>
<td>27</td>
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