Obstetric near miss events among women with a history of mental illness: a data linkage study

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Maternal Mortality

- Maternal mental illness affects 1 in 4 women during pregnancy, which may increase the risk of pregnancy & birth complications
- Between 2014-16, the UK maternal mortality rate was 9.8 per 100,000 maternities
- Almost a quarter (24%) of the women who died during pregnancy or childbirth had a mental illness
- Maternal mortality is increasing among women with multiple vulnerabilities
- Consistent evidence of ‘diagnostic overshadowing’
Near Miss Approach

- As maternal deaths become rarer, monitoring maternal near misses has become an important tool improving healthcare

  “A woman who nearly died but survived a complication that occurred during pregnancy or childbirth”

- Six near miss occur per maternal death

- Although, globally rates vary widely from 0.14% to 14.98%
Study Aims

- No previous studies have investigated the obstetric near miss events among women with mental illness.

- The overall aims of this study were to investigate:
  - The rate of obstetric near miss events in South London among women with and without a history of mental health service use.
  - The characteristics and factors associated with obstetric near miss events among women with a history of mental health service use.
Cohort Generation

- Data from CRIS & HES were linked to identify all women:
  - Childbirth (type 2) episode recorded in HES (2007-16)
  - SLaM service use recorded in CRIS prior to the childbirth episode

- A comparison group was generated, consisting of:
  - All women with a recorded childbirth episode (2007-16)
  - No history of SLaM service use
  - Resident within a local London borough
Outcomes

The English Maternal Morbidity Outcome Indicator (EMMOI)

- The EMMOI was used to identify obstetric near miss events occurring during the childbirth episode
- Consists of 26 morbid events: 17 diagnoses and 9 procedures, previously validated in HES
- Diagnostic (ICD-10) & intervention (OPC-4) codes in the childbirth episode were searched in HES
- Mental health data was extracted from CRIS using structured fields and NLP applications
- Sociodemographic and maternity data was extracted from HES
Maternal Morbidity Outcome Indicator Items

**DIAGNOSES**
- Acute abdomen
- Acute renal failure
- Cardiac arrest, failure or infarction
- Cerebral oedema or coma
- Disseminated intravascular coagulopathy
- Cerebrovascular accident
- Major complications of anaesthesia
- Obstetric embolism
- Shock
- Sickle cell anaemia with crisis
- Status asthmaticus
- Status epilepticus
- Uterine rupture
- Eclampsia
- Sepsis
- Cerebral venous thrombosis

**INTERVENTIONS**
- Assisted ventilation
- Curettage in combination with general anaesthetic
- Dialysis
- Evacuation of haematoma
- Hysterectomy
- Procedures to reduce blood flow to uterus
- Re-closure of disrupted caesarean section wound
- Repair of bladder or cystostomy
- Repair of intestine
Study Sample

All childbirth episodes between 2007 & 2016 with prior contact with SLaM

Extracted Data (Linked CRIS and HES)
N=14,791

Excluded
n=1221

Childbirth episodes with any prior SLaM contact
n=13,570

All childbirth episodes between 2007 & 2016 with no contact with SLaM

Extracted Data (HES Only)
N=225,184

Excluded
N=1990

Childbirth episodes with no prior SLaM contact
n=223,274
Among the 13,570 women with a history of SLaM service use:

- 42% of women had been seen in the year prior to pregnancy
- Mean of 26 (s.d. 69) contacts
- First contact on average 3.9 (s.d. 2.8) years prior to the childbirth episode
## Sample Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Cases</th>
<th>Controls</th>
<th>P value</th>
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</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
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<tr>
<td>Mean Years: (sd)</td>
<td>28.9 (6.4)</td>
<td>31.1 (5.5)</td>
<td>&lt;0.0001</td>
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<tr>
<td><strong>Ethnicity</strong></td>
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<tr>
<td><em>White</em></td>
<td>6,759 (42.8)</td>
<td>100,508 (51.7)</td>
<td>0.014</td>
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<tr>
<td><em>Other Ethnic Group</em></td>
<td>6,040 (47.2)</td>
<td>93,954 (48.3)</td>
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<td><strong>Smoking Status</strong></td>
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<td><em>Never</em></td>
<td>8,326 (61.4)</td>
<td>219,072 (98.1)</td>
<td>&lt;0.0001</td>
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<tr>
<td><em>Past/Current</em></td>
<td>5,244 (38.7)</td>
<td>4,202 (1.9)</td>
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<tr>
<td><strong>Gestational age</strong></td>
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<tr>
<td>Mean weeks (s.d.)</td>
<td>38.3 (4.3)</td>
<td>38.9 (3.5)</td>
<td>&lt;0.0001</td>
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<tr>
<td><strong>Birth weight</strong></td>
<td></td>
<td></td>
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<td>Mean grams (s.d.)</td>
<td>3218.5 (631.8)</td>
<td>3340.1 (580.2)</td>
<td>&lt;0.0001</td>
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8.8 per 1,000 births among women with a history of mental illness vs. 5.8 per 1,000 births among controls
Results

Adjusted for: Ethnicity, maternal age, multiple birth & smoking status
Conclusions

- Women with a history of mental illness have an increased risk of life-threatening complications during childbirth
- In part driven by socio-economic differences and smoking status
- But, overall risk persists, particularly for complications with vague or sudden symptom onset
- Smoking cessation support for women with mental illness should be prioritised to prevent cardiac failure during labour
- Joint care management during pregnancy may help reduce the risk of diagnostic uncertainty among women with multiple morbidities
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