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Can Specialised Antenatal Care Improve Maternal and Neonatal Outcomes?

A Retrospective Cohort Study of an NHS Joint Obstetric-Psychiatric Clinic

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INTRODUCTION

The North East London Foundation NHS Trust (NELFT) Perinatal Parent-Infant Mental Health Service (PPIMHS) runs a Joint Obstetric-Psychiatric (JOP) clinic. Each patient is seen by both a consultant perinatal psychiatrist and a consultant specialist obstetrician in the same appointment. Women attend the JOP clinic at pre-defined intervals during their pregnancy. These are typically 16, 22, 28, 34, 36 and 38-41-weeks' gestation. Following delivery, service-users have a 6-8 week and 3-month follow-up. The service can continue to see each service-user up to one-year following the birth of their child. Women allocated to the 'High Risk' pathway are eligible to attend the JOP clinic.

Pregnant women with pre-existing Severe Mental Illness (SMI) are known to be at an increased risk of adverse maternal, obstetric, and neonatal outcomes. However, poorer antenatal care attendance has been associated with SMI. To our knowledge, research has not yet examined whether a JOP clinic will optimise maternal and neonatal outcomes.

The aims of the study were: **1)** To characterise the service-users who attended the PPIMHS JOP clinic at NELFT. **2)** To analyse the effect of SMI vs Moderate Mental Illness (MMI), JOP clinic attendance, use of psychotropic drugs and delivery mode on maternal outcomes at 6-8 weeks and 3-months. **3)** To investigate the effects of SMI vs MMI, JOP clinic attendance, maternal use of psychotropic drugs and delivery mode on neonatal adverse outcomes (preterm delivery, neonatal admission)

METHODS

SAMPLE: This is a retrospective cohort study. We collected data from electronic health records of 59 patients that attended JOP clinics from January 2019 to March 2020. Our primary outcome was whether participants were 'Unwell' vs 'Well' at 6-8 weeks and 3-month follow up. 'Unwell' (*n*=25) criteria were admission to a Mother and Baby Unit (MBU), deterioration in mental state, inpatient admission, moderate symptoms of anxiety and/or depression or under the care of a Home Treatment Team (HTT). The criterion for being 'Well' v was being stable in mental state at time of follow-up. An adverse neonatal outcome was defined as either preterm birth or neonatal admission. We used definitions of Severe Mental Illness (SMI); schizophrenia, bipolar affective disorder and related disorders (*Public Health England, 2018*), and Moderate Mental Illness (MMI); were disorders not classified as SMI.

ANALYSIS: We examined whether the following variables affected maternal and neonatal outcomes; mental health diagnosis (SMI *n=26* vs MMI *n=33*) attendance at JOP (<2 visits *n=23* vs >2 visits *n=36*), use of psychotropic medication in the third trimester (use *n=34* vs no use *n=25*) and mode of delivery (caesarean section *n=* 26 vs vaginal delivery *n*=33). Chi-square and binomial logistic regression tests were used for data analysis.

RESULTS

1) Characteristics of service-users attending the PPIMHS JOP clinic

Table 1: Comparison of characteristics in JOP clinic service-users with MMI vs SMI

	All sample	Moderate Mental Illness	Severe Mental Illness	*P* value
Age at delivery (years), M (SD)	29.9 (5.6)	30.1 (5.0)	29.7 (6.3)	.072
Ethnicity, any white background % (n)	64.4 (38)	69.7 (23)	57.7 (15)	.555
Lifetime diagnosis, %(n)	91.15 (54)	100(33)	80.8 (21)	.008
Duration of illness (years), M (range) / previous psych	4.3 (0.2-2.22)	3.3 (2.0-3.5)	5.5 (.50-22)	.040
Previous postpartum psychosis, yes % (n)	5.1 (3)	0 (0)	11.5 (3)	.045
Family history (post-partum event), yes	5.1 (3)	0 (0)	11.5 (3)	.045
Medication use at baseline, yes % (n)	59.3 (35)	63.6 (21)	53.8 (14)	.447
Medication use in third trimester, yes % (n)	57.6 (34)	54.5 (18)	61.5 (16)	.589
Psychotropic medication during pregnancy				
No medication	42.4 (25)	45.5 (15)	38.5 (10)	
Antipsychotic or Anticonvulsant alone	11.9 (7)	0 (0)	26.9 (7)	.016
Antidepressant alone	23.7 (14)	27.3 (9)	19.2 (5)	
Polypharmacy	22.0 (13)	27.3 (9)	15.4 (4)	
Medication use in third trimester, yes % (n)	57.6 (34)	54.5 (18)	61.5 (16)	.589
JOP Clinic Attendance % (n)				
0-2 visits	39.0 (23)	51.5 (17)	23.1 (6)	.026
>2 Visits	61.0 (36)	48.5 (16)	76.9 (20)	
Mode of delivery				
Vaginal delivery	55.9 (33)	63.6 (21)	46.2 (12)	.179
Caesarean section	44.1 (26)	36.4 (12)	53.8 (14)	
Neonatal Outcomes				
Preterm birth, yes % (n)	11.9 (7)	12.1 (4)	11.5 (3)	.945
Neonatal admission, yes % (n)	15.3 (9)	21.2 (7)	7.7 (2)	.138

2) Effects on Maternal outcomes at 6-8 week and 3-months

The logistic regression model for 6-8-week maternal outcome was statistically significant, $X^2(8)=10.43$, p=.031. The model explained 22.2% of the variance and correctly classified 65% of cases. The model was not statistically significant at 3-month follow-up.

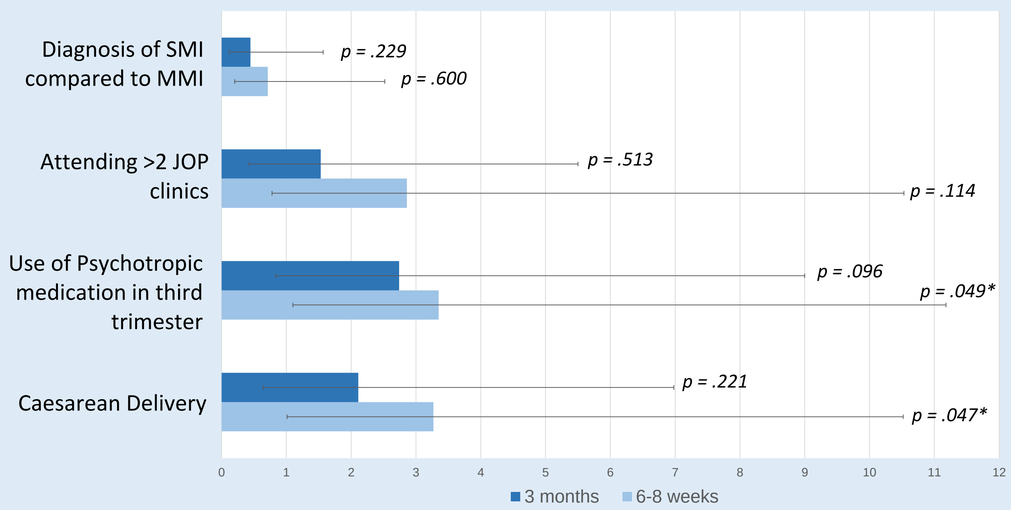

Figure 1. Odds Ratio of being 'unwell' at 6-8 week and 3-month postpartum follow-up.
Error bars represent 95% confidence interval

3) Effects on Adverse Neonatal outcomes

The model was statistically significant, $X^2(4)$ =11.13, p=.025. The model explained 27.0% of the variance in adverse neonatal outcomes and correctly classified 84.7% of cases.

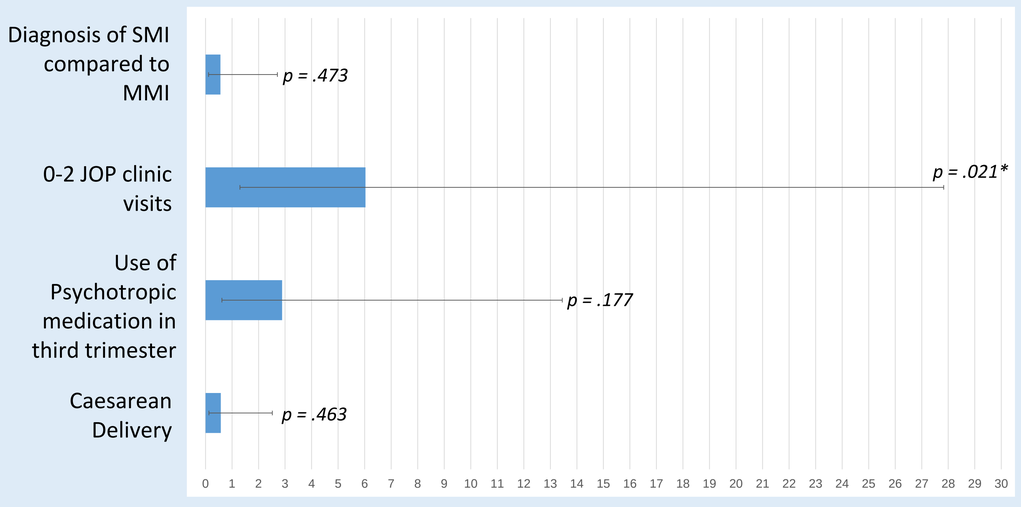

Figure 2. Odds Ratio of adverse neonatal outcome
Error bars represent 95% confidence interval

DISCUSSION

The findings from the 1st aim revealed those with an SMI significantly attended more JOP clinics than those with an MMI. The higher rates of attendance may be due to the high-risks associated with SMI; thus, requiring more appointments. All service-users who had previous history of postpartum psychosis or a family history of a postnatal event were unwell at 6-8 weeks. This was statistically significant.

In our 2nd aim, one significant finding was that taking medication in the third trimester predicted the likelihood of women becoming unwell at 6-8-week follow-up. This may reflect that medication is given to those who are most unwell or at high risk of illness. Delivery mode also significantly predicted being unwell at 6-8 weeks. However, the model was not significant at 3-months postnatal.

MMI or SMI was not significant in predicting the likelihood of subjects becoming unwell at either 6-8-week or 3-month follow-up. Therefore, this study could not determine that severity of mental health diagnosis increases the risk of an adverse maternal outcome.

For the 3rd aim, attending 0-2 JOP clinics was a significant predictor of an increase in adverse neonatal outcome. This is indicative of women with lower JOP clinic attendance being six times more likely to have babies with poorer neonatal outcomes. A trend was that SMI and caesarean section were associated with positive neonatal outcome and taking psychotropic medication was associated with adverse neonatal outcome. However, these trends were not significant.

A main strength of this study is its clinical implications. If this model is effective it could be implemented across the UK and help optimise perinatal care for women with mental health difficulties. The limitations were that the sample size was small, and findings were not compared with a control group. Future research is to compare findings from the JOP clinic and compare with areas that have not yet implemented JOP clinics.