

A phenome-wide association study of perinatal depression reveals novel comorbidities

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BACKGROUND

- Perinatal depression (PD), a common complication of pregnancy, has profound, multigenerational adverse effects
- Continued debate
 - Is PD the result of the same factors as major depressive disorder (MDD) or is the etiology completely distinct and simply results in a similar phenotype?
- Identification of comorbidities may shed more light on their connection
- **Objective:** To identify novel comorbidities associated with PD

METHODS

- The study population was obtained from VUMC's Synthetic Derivative, a large de-identified electronic health record (EHR) database
 - Females with indications of pregnancy
 - At least one live birth
 - Must have EHR data at least one year prior to conception and one year after delivery
- PD and MDD cases were defined using International Classification of Diseases codes
- We performed a phenome-wide association (PheWAS) study for each mental health condition, adjusting for race and ethnicity, to assess their association with phecodes
- Bonferroni corrected p-values were used to determine significance

RESULTS

Figure 1: PheWAS for Perinatal Depression

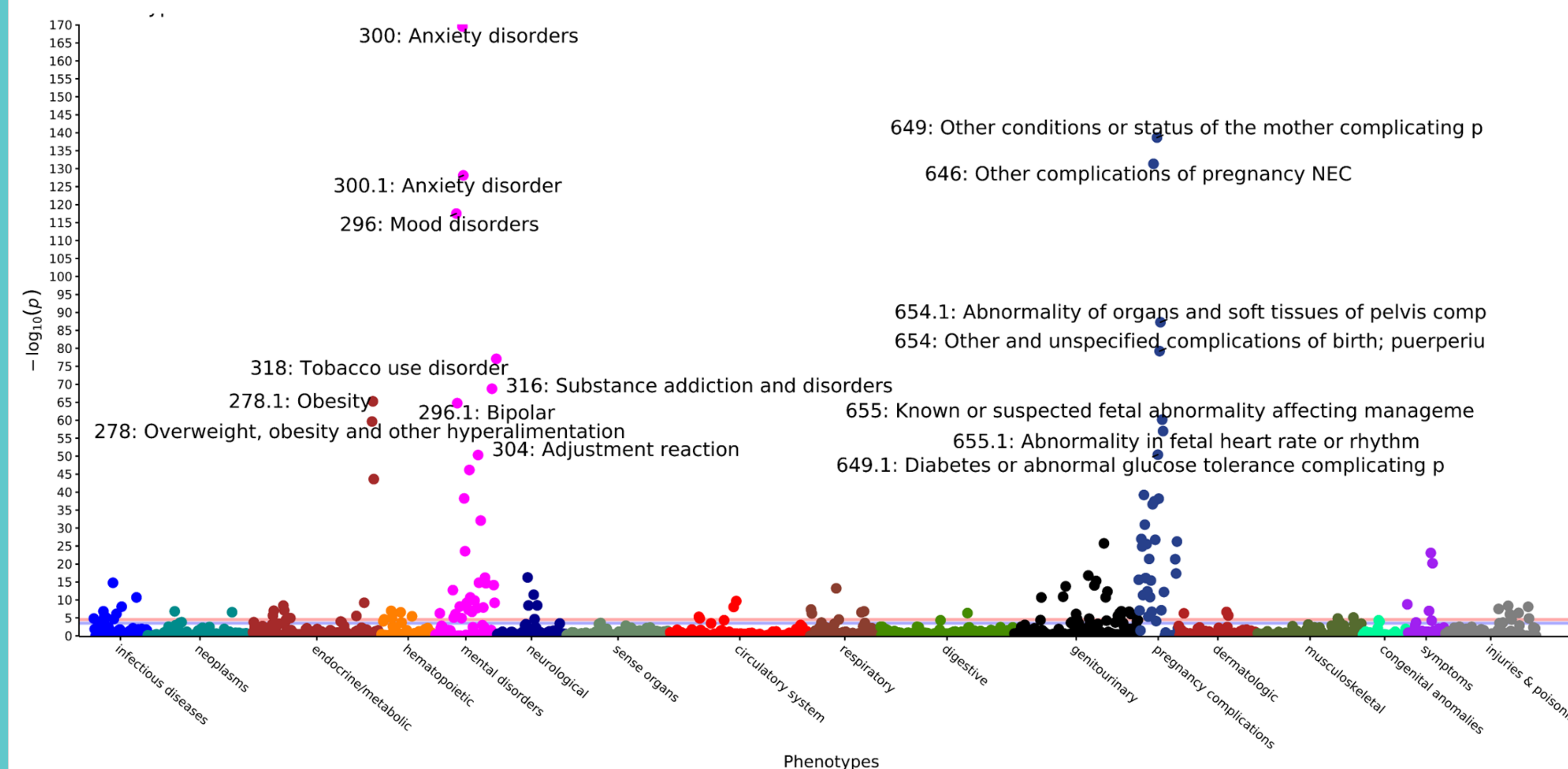
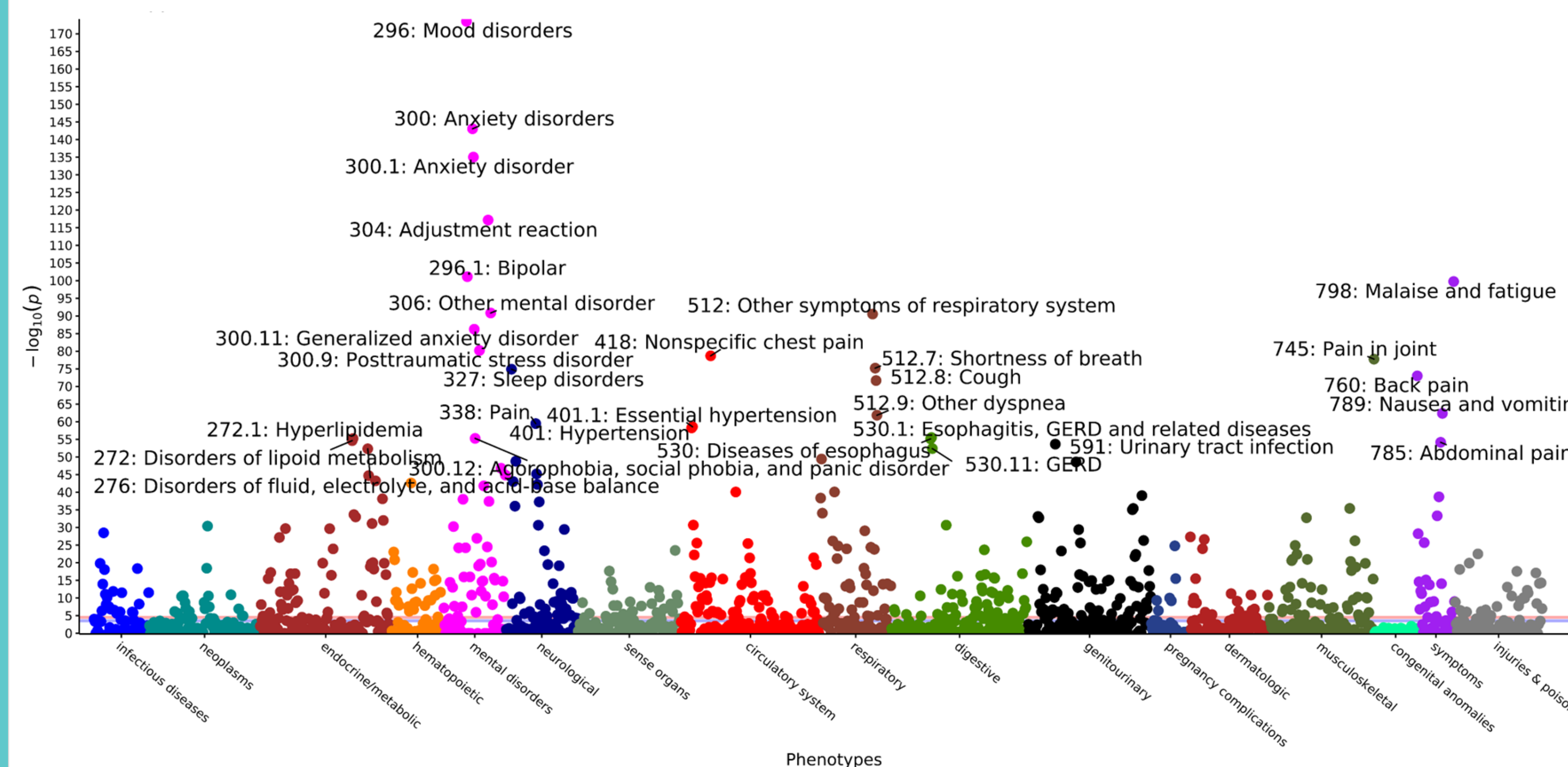


Figure legends: Manhattan plots displays phenotypic associations with PD and MDD with each dot representing a unique phecode. Phecodes are group by disease category on the x-axis. The y-axis is negative log p-values.

- There were 8,412 individuals included (PD cases: 2,341 PD, MDD cases: 1,304)
- 145 and 547 phecodes were associated with PD and MDD respectively
- There were 105 overlapping comorbidities
- Replicating previous research, other mental health disorders were strongly associated with both conditions
- 40 unique PD associations, 32 were pregnancy complications
 - Obstetrical/birth trauma
 - Fetal abnormalities
 - Abnormalities of pelvic organs or soft tissue complicating pregnancy
 - Anemias
 - Hemorrhage
 - Genitourinary tract infections
 - Excessive vomiting during pregnancy
- Other PD-specific associations: anemias, coagulation defect in the perinatal period, disorders of the uterus, skin neoplasms with uncertain behavior, intestinal infection, elevated blood pressure without hypertension diagnosis, and female pelvic peritoneal adhesions

Figure 2: PheWAS for Major Depressive Disorder



CONCLUSION

- Though there were many overlapping associations between PD and MDD, we identified several comorbidities only associated with PD
- Most of these comorbidities occur specifically during the perinatal period
- Additional research evaluating temporality of these relationships is needed