



Original article

Schizotypal and affective traits in the offspring of antenatally depressed mothers – Relationship to family history of psychosis in the Northern Finland 1966 Birth Cohort

T. Taka-Eilola (née Riekkilä)^{a,*}, J. Miettunen^{c,d}, P. Mäki^{a,b,c,e,f,g,h}^a Department of Psychiatry, Research Unit of Clinical Neuroscience, University of Oulu, Finland^b Department of Psychiatry, Oulu University Hospital, Finland^c Medical Research Center Oulu, Oulu University Hospital and University of Oulu, Finland^d Center for Life Course Health Research, University of Oulu, Finland^e Department of Psychiatry, Länsi-Pohja Healthcare District, Finland^f Department of Psychiatry, the Middle Ostrobothnia Central Hospital, Soite, Finland^g Mental Health Services, Joint Municipal Authority of Wellbeing in Raase District, Finland^h Mental Health Services, Basic Health Care District of Kallio and Oulaskangas-Visala Hospital, the Northern Ostrobothnia Hospital District, Finland

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ABSTRACT

Background: Maternal depression is relatively common during pregnancy. However, follow-ups of the adult offspring of antenatally depressed mothers are scarce. Previously we found the risk of schizophrenia to be higher in the adult offspring with antenatally depressed mothers and parents with psychosis than in subjects with only one or neither of these risk factors. The aim was to study whether the risk of schizotypal or affective traits differ among adult offspring with antenatally depressed mothers with or without a parental history of psychosis when compared with offspring without antenatally depressed mothers and without parental psychosis.

Methods: In the general population-based Northern Finland 1966 Birth Cohort (NFBC 1966), the mothers of the cohort members were asked at mid-gestation whether they felt depressed. Parental psychosis (Familial Risk, FR) was detected using the Finnish Care Register for Health Care. In the 31-year field study, seven psychometric questionnaires surveyed schizotypal and affective traits in the offspring. The final sample included 4928 individuals (2203 males).

Results: There were no statistically significant differences in mean scores on the schizotypal and affective scales between offspring with and without antenatally depressed mothers, or between subjects with and without parental psychosis. The scores were not highest in the subjects with both maternal antenatal depressed mood and FR.

Conclusion: Surprisingly, maternal depressed mood during pregnancy was unlikely to increase the risk of schizotypy or affective traits in adult offspring, and not even with parental psychosis (FR) in this general population-based birth cohort with about 5000 subjects.

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1. Introduction

1.1. Background to the study

Schizophrenia is the most severe mental disorder with high genetic vulnerability [1]. Schizotypy can be regarded as a continuum from slightly deviant beliefs and experiences to psychotic experiences [2]. It is a rather permanent personality

trait and has a genetic liability to schizophrenia [3–5]. Schizotypal features increase the risk of transition into psychosis in clinical high-risk patients [6,7]. Affective symptoms are not part of schizotypy, but they may also predict psychotic disorders and often manifest with prodromal symptoms of psychosis [8,9]. In the previous literature, the findings on schizotypal traits in first-degree relatives of psychotic probands are inconsistent when measured by the Wisconsin Schizotypy Scales (see descriptions of the scales in the Supplement) [10–12] and Schizotypal Personality Questionnaire (SPQ) [13–16]. It has been proposed that negative and disorganised schizotypy is more present in subjects with familial risk of psychosis [17–21].

* Corresponding author at: Department of Psychiatry, Research Unit of Clinical Neuroscience, University of Oulu, P.O. Box 5000, FIN-90014 University of Oulu, Finland. Tel.: +358 41 4364184.

E-mail address: tiinarie@mail.student.oulu.fi (T. Taka-Eilola (née Riekkilä)).

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Increasing evidence has emerged of gene–environment interaction in the origins of schizophrenia [22,23]. It has been suggested that the development of schizophrenia may be the result of interaction between a genetically inherited liability to schizophrenia and bio-psychosocial early environmental factors, including early traumas [23,24] and a sub-optimal early family interaction environment [25,26]. Previously we found the risk of schizophrenia to be higher in the young adult offspring of both antenatally depressed mothers and parents with psychosis than in subjects with only one or neither of these risk factors [27]. Mothers' antenatal depression may act as an additive factor for subjects vulnerable to schizophrenia, possibly via adverse neurodevelopment. This finding could be an example of a gene environment or a gene-gene interaction [28] in the development of schizophrenia.

Maternal depression is common during pregnancy, affecting 10–15% of mothers [29,30], like it is in the postnatal period. According to recent studies, antenatal depression is a risk factor for emotional and behavioural problems in childhood and adolescence in the offspring [31]. However, follow-up studies up to adulthood in the offspring of antenatally depressed mothers are rare, other than the several previous reports in the NFBC 1966 [27,32–36]. Even so, studies of schizotypal and affective traits in adult offspring of antenatally depressed mothers are lacking.

1.2. Aim of the study

To the authors' knowledge, there have been no epidemiological reports on schizotypal or affective traits in the offspring of antenatally depressed mothers. The objective was to study schizotypal and affective scales in the offspring of antenatally depressed mothers with and without a parental history of psychosis (Familial Risk, FR) in the NFBC 1966. Our hypothesis was that the scores on the schizotypal and affective scales in the offspring of antenatally depressed mothers and with parental history of psychosis differ from the scores of NFBC 1966 members without maternal antenatal depression and without FR for psychosis.

2. Material and methods

Data were gathered on maternal depressed mood during pregnancy, parental psychosis (FR), and schizotypal and affective traits among subjects of the Northern Finland 1966 Birth Cohort (NFBC 1966). Data collection started antenatally. In 1997, a 31-year follow-up field study was conducted.

2.1. Sample collection of the Northern Finland 1966 Birth Cohort (NFBC 1966)

The data were obtained from the NFBC 1966, an unselected, population-based series of 12,058 live-born children [37]. The data

from the NFBC 1966 are available for all researchers; the procedure for obtaining the data is described at <http://www oulu.fi/nfbc/>.

As part of the 31-year follow-up of the birth cohort, all 8463 cohort members living in Northern Finland or in the Helsinki area on 1 January 1997 and who had returned a previous postal questionnaire were invited to a clinical examination [38]. Eventually, 5960 (71%) participated in the clinical examination and were then given a number of questionnaires employing self-rated psychological scales to complete.

The final sample size for this present study was 4928 participants (59% of those invited; 45% males) who gave proper answers on at least one of the scales and a maximum of two endorsing answers on the infrequency scale. A total of 43% of the subjects with a psychiatric disorder and 60% of those without any psychiatric hospitalisations returned the questionnaire with psychometric assessments [38].

2.2. Ethics statement

Permission to gather the data was obtained from the Ministry of Social Affairs and Health. The study was approved by the Ethical Committee of the Northern Ostrobothnia Hospital District in Oulu, Finland. Written informed consent was obtained from the subjects after they had been given a complete description of the research.

2.3. Maternal depressed mood in pregnancy

Data concerning the mothers had been gathered antenatally and at birth in 1965–1966. The mothers were asked by the interviewing nurse at the antenatal clinic at mid-gestation whether they felt that their mood had so far during pregnancy been normal, depressed or very depressed [37]. Of the mothers, 13.9% rated themselves as depressed (11.8%) or very depressed (2.1%) during pregnancy [27]. These two categories were combined under the heading “depressed” in the analyses that followed. Information concerning the mothers' antenatal mood was available for 10,658 (96.7%) of the offspring living in Finland at the age of 16 years.

2.4. Parental history of psychosis (Familial Risk, FR)

The national Finnish Care Register for Health Care (former Finnish Hospital Discharge Register, FHDR) covers all mental and general hospitals, beds in local health centres and military, prison and private hospitals nationwide. Mothers and fathers of cohort members appearing on the register between 1972 and 2005 with any diagnosis of psychosis (i.e. ICD-8 290–299, ICD-9 diagnoses 295, 2961E, 2962E, 2963E, 2964E, 2965E and 297–299, and ICD-10 F 20, F22–29) were identified. Register data on maternal and paternal psychosis were available only from 1972 onwards. There was a total of 115 twins (2.3%) in the sample who were lacking their fathers' register data; these were excluded from the material. The cohort members were divided into those with and without a parental history of psychosis in order to examine the FR attached to psychosis.

2.5. Outcome variables: schizotypal and affective scales in the offspring

To measure schizotypal traits, the Perceptual Aberration Scale (PER), Social Anhedonia Scale (SAS) and Physical Anhedonia Scale (PAS) [2,39] and the Schizoidia scale (GM) [40] were used. The Bipolarity II Scale (BIP2) [41] and the Hypomanic Personality Scale (HPS) [42] were used to assess both psychosis proneness [43] and affective traits, and the Symptom Checklist (SCL, Hopkins Symptom Checklist-25) [44] was used to measure affective traits

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