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Childhood predictors of recurrent abdominal pain in adolescence: A 13-year population-based prospective study☆,☆☆

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Abstract

Objective: To investigate maternal and child emotional symptoms, physical health problems, and negative life events measured at children's age 18 months and 12 years as potential predictors for self-reported recurrent abdominal pain (RAP) in adolescents (14 years). **Methods:** A population-based prospective study conducted at child health clinics (preventive health care) in Norway followed a cohort of 916 mothers with children from children's age 18 months until adolescence. Child self-report was obtained from 12 years of age. Outcome measure was adolescent self-reported RAP. **Results:** Of 456 adolescents, 58 (13%) reported RAP. Of these, 36 (62%) were girls. By multivariate analyses, the following *maternal factors* predicted RAP in adolescence: psychological distress at children's age 18 months (OR, 2.5; 95% CI, 1.3–4.8) and a maternal history of psychological distress at children's age 12 years (OR, 3.2; 95% CI, 1.7–6.2). The following *child factors* measured at age 12 years predicted RAP in adolescence: abdominal (OR, 2.5; 95% CI, 1.3–4.9) and extraintestinal pain (OR, 2.3; 95% CI, 1.2–4.4) by maternal report, self-reported frequent extraintestinal pain (OR, 2.9; 95% CI, 1.4–5.9), and self-reported depressive symptoms (OR, 2.4; 95% CI, 1.1–5.1). Negative life events and physical health in mothers and toddlers did not predict RAP. **Conclusions:** This is the first cohort study that finds maternal psychological distress in *early* childhood to predict RAP in their offspring 13 years later. Our results support that maternal psychological distress and preadolescent children's depressive and somatic symptoms may play a role in the development of RAP.

Keywords: Recurrent abdominal pain; Adolescents; Parents; Risk factors; Longitudinal study

Introduction

Chronic or recurrent abdominal pain (RAP) is a common pain syndrome in children and adolescents, and is defined as at least three episodes of pain, severe enough to affect activities, over at least 3 months during the preceding year [1,2]. Previous studies indicate a prevalence between 10% and 15% in schoolchildren with two peaks, at ages 4–6 and 7–12 years, and that RAP accounts for 2–4% of all pediatric office visits [2,3]. The vast majority of children and adolescents with RAP have functional abdominal pain [4–6]. These are chronic or recurrent gastrointestinal symptoms not explained by structural or biochemical abnormalities [7].

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The etiology of RAP is multifactorial and still unclear. Both hereditary and environmental factors appear to contribute [2,8]. Observational studies with a cohort design may increase our understanding of RAP. However, such studies of children and adolescents with RAP are scarce. One of the few existing population-based studies found that parental anxiety and maternal somatic symptoms in the first year of a child's life predicted RAP in 6-year-old children [9]. Furthermore, cohort studies exploring child predictors for RAP in adulthood have reported diverging results. One birth cohort study reported childhood RAP to be a predictor of irritable bowel syndrome, the most common RAP, in adults [10]. In contrast, another birth cohort study reported that RAP in childhood predicted psychiatric disorders and was modestly associated with other common somatic symptoms in adulthood [11]. Moreover, several population-based and clinical studies, the majority of which have a *cross-sectional* design, have found significant associations between RAP and anxiety, depressive, and somatic symptoms in children and their parents [12–16]. Another factor, higher levels of negative life events (NLE), is reported more frequently by children with RAP than by healthy controls [3]. Three prospective [two short-term and one long-term (5 years)] clinical studies have found NLE to be associated with symptom maintenance in patients with RAP [17–19].

The predictive value of maternal and child emotional symptoms, physical health problems, and NLE for RAP is still unclear. Enhanced knowledge about childhood predictors of RAP in adolescents is important in understanding the development of RAP and may allow the identification of children at risk of sustained abdominal pain. We are not aware of any population-based study that explores potential childhood predictors of RAP in adolescents. Therefore, we aimed to investigate maternal and child emotional symptoms, physical health, and NLE in childhood as potential predictors of self-reported RAP in a population-based sample of adolescents (14–15 years).

Method

Sample and design

The current sample is based on an ongoing population-based observational study that has followed a cohort of 916 mothers with children from the age of 18 months (*t*1) until the age of 14 years (*t*6). The cohort was assessed by questionnaires at six different time points (*t*1–*t*6). Child self-report was obtained from the age of 12 years (*t*5). We chose to focus on *t*1 and *t*5 vs. *t*6. *T*5 was especially chosen because of the use of child self-report which is considered to be the most valid measure for assessing pain [20]. *T*1 was chosen to attend to the longest time span from *t*1 to *t*6. Furthermore, as common in many cohort studies, participants were lost to follow-up (50% from *t*1 to *t*6). Therefore, to ensure continuity of mothers across time points, only participating mothers at *t*5 with *t*1 data were included in the analyses at *t*5. Adolescents (n=456) who completed questions about RAP were included in the cross-sectional analyses at *t*6. Mothers (at *t*1 and *t*5) and children (at *t*5) with RAP data by adolescent self-report at *t*6 were included in the longitudinal analyses of possible predictors for RAP. Table 1 gives the number of participants at each assessment and participants in the longitudinal analyses.

Original sample and procedure

Routinely, more than 95% of all Norwegian families with children attend a public health program during the first 4 years of the children's lives. All families attending 19 child health clinics in eastern Norway in 1993 for the scheduled 18-month vaccination visit were invited to complete a questionnaire (*t*1). Only maternal data were used in the analyses because few fathers participated. Of the 1081 eligible families, 916 mothers (85%) agreed to participate. More than 95% of the families were ethnic Norwegians and 51% of the children were girls. The age of the mothers ranged from 19 to 46 years, with a mean age of 30 years (S.D.=4.7). The sample at *t*1 was an overall representative of the diversity of social environments in Norway [21]. Nonrespondents did not differ significantly from respondents with respect to maternal age, education, employment status, number of children, and marital status [21]. Nurses at the health centers obtained informed consent from the mothers and administered the collection of data for the three first assessments. In the last assessment, questionnaires were sent by post to the families. The study was approved by the Regional Committee on Medical Research Ethics and the Norwegian Data Inspectorate.

Measurements

The outcome measure was self-reported RAP in the adolescents (*t*6). The adolescents answered one main

Table 1
Number of participating mothers and adolescents, and number of participants with end-point data of RAP at *t*1 and *t*5

Time point	Children's age	Mothers, *n*	Adolescents, *n*	Mothers of adolescents with RAP data at *t*6, *n*	Children with RAP data at *t*6, *n*
*t*1	18 months	916		436	
*t*5	12 years	590	546	380[a]	380
*t*6	14 years	478	456		

*t*1, *t*5 and *t*6 indicate Time Points 1, 5, and 6.

[a] Only participating mothers at *t*5 with baseline data were included in the analyses at *t*5.