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## Research paper Outcome of children born after pregnancy denial

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#### ABSTRACT

*Introduction:* Denial of pregnancy remains a phenomenon little known to healthcare professionals. Yet its repercussions are far from negligible. The aim of this study was to assess whether denial of pregnancy has an impact on the infant's development.

*Patients and method:* This prospective study included 51 full-term infants born in Nancy Regional Maternity Hospital between 1 January 2009 and 30 June 2015. In this study, the development of the children was followed longitudinally. We collected data during the neonatal period, at 9 months, and at 2 years of age from the infants' file and standardized medical certificates, and current data through a telephone questionnaire. Three fundamental aspects of the infants' development were analyzed: height and weight growth, psychomotor development, and the existence of pathologies. Given that this was a preliminary study aiming at exploring facts, no statistical tests were carried out.

*Results:* The rate of denial of pregnancy was one birth in 300 during the study period. These infants showed proportional intrauterine growth restriction, which leveled out later, with their height and weight growth normal by month 9. The full-term perinatal mortality rate was 5%. The infants showed no sign of increased morbidity; 20% of them presented with delayed psychomotor development at 9 months of age, with an increased impact as they grew older. The rate reached 30% after 24 months, half of which were language disorders.

*Conclusion:* The results of this preliminary study point out the need for thorough monitoring of these infants throughout infancy.

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#### 1. Introduction

Denial of pregnancy remains a little known phenomenon. Its definition lacks clarity, but it has recently been highlighted by dramatic events such as the Courjault case which ended in repeated infanticide at birth. Indeed, denial of pregnancy today has no international definition. In most studies the definition given is a lack of pregnancy awareness after 20 weeks of amenorrhea [1]. The denial can be partial when the pregnancy is discovered and recognized during the gestation period and complete when the pregnancy is ignored until delivery. In Europe, Friedman et al. reported a rate of about one case out of 400–500 births [2]. The media has contributed to the stigmatization of women suffering from pregnancy denial. However, the studies designed to explore the medical, social, and psychologic profile of these women failed to find any

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https://doi.org/10.1016/j.arcped.2018.01.004 0929-693X/© 2018 Elsevier Masson SAS. All rights reserved. specific characteristic [1,2]. Therefore, it is important to keep in mind that denial of pregnancy can be observed in any woman of childbearing age.

In France, the follow-up of pregnant women and newborn infants is strictly codified. During the pregnancy, clinical, biological, and ultrasound examinations are carried out to prevent and detect pathologies [3]. Infants are also monitored, sometimes under closer scrutiny, if they show signs of specific pathologies or were born prematurely.

In case of denial of pregnancy, the mother's lack of awareness of her condition can lead to exposure to numerous risk factors (tobacco, alcohol, medications, diseases), which may affect the fetus. Moreover, the question of the possible consequences on fetal development remains. Gynecological studies tend to show a specific fetal position in the mother's womb, along the backbone, thus preventing the swelling of the belly usually visible in pregnant women. These fetuses move less than the others as if they were in hiding [4]. Hence, one can raise questions on further repercussions on these children.

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Yet, currently no study has been conducted on the subject, all studies stopping at the moment when the child is born. However, in this particular case, birth is actually just the beginning.

The aim of this study was to assess whether denial of pregnancy has an impact on height and weight, psychomotor development, and possible subsequent pathologies in these children.

#### 2. Material and method

#### 2.1. Population

This prospective study included full-term infants born of a mother suffering from partial or complete denial of pregnancy (defined as lack of awareness of pregnancy after 20 weeks of amenorrhea) at the Regional Maternity Hospital of Nancy between 1 January 2009 and 30 June 2015. Premature infants, stillborn infants, and infants born anonymously with no follow-up in France, were excluded.

The diagnosis of pregnancy denial was made by crossing files coded by the Medical Information Department as "insufficient pregnancy monitoring" with the database of the Nancy Regional Maternity Hospital's social workers. The mothers were informed of the study by a letter sent to their home address. They were given a 3-week time limit to oppose the study. Beyond this time limit and in the absence of objections, the mother was called to answer the telephone questionnaire. The study was approved by the Ethics Protection Committee on 3 May 2017 and complied with reference methodology MR-003.

#### 2.2. Data collection

We retrospectively collected data related to the longitudinal development of the infants: we collected data during the neonatal period, at 9 months, and at 2 years of age from the infants' file and their standardized medical certificates together with current data on the children, aged between 2 and 7 years, in a telephone interview with the mother.

### 2.2.1. Neonatal data

Neonatal period data were taken from obstetrical files. We collected anthropometric data (weight, height, head circumference), as well as the existence of perinatal infection and malformations.

#### 2.2.2. Data at months 9 and 24

These data were collected at the Mother and Infant Protection organization based on medical certificates. Since 1970 in France, medical certificates have been mandatory at day 8 and, at 9 and 24 months [5].

### 2.2.3. Data concerning the child's current medical condition

Mothers were asked to answer a telephone questionnaire. The questions focused on three issues: the existence of pathologies or any specific care, growth in height and weight, and psychomotor development. If the mother could not be reached, we asked the child's general practitioner.

### 2.3. The child's development

Three major aspects of the child's development were analyzed: growth in height and weight, psychomotor development, and possible pathology.

Growth in height and weight were studied based on anthropometric data taken at birth, 9 months, 24 months, and between 2 and 7 years of age. Psychomotor development was assessed according to the Denver Developmental Screening Test. This allowed us to appreciate both gross and fine motor skills as well as language and social contact, the four pillars of assessment for child development.

Finally, the comprehensive care of the child was assessed, including testing for pathologies and/or specific monitoring.

#### 2.4. Statistical data

Since this study was an exploratory study, no statistical test was performed.

Qualitative variables are presented in the form of numbers and percentages and quantitative variables are presented as means with standard deviations or as medians with interquartile ranges.

#### 3. Results

Between 1 January 2009 and 30 June 2015, 75 infants were born to mothers suffering from pregnancy denial at the Nancy Regional Maternity Hospital (22 of which were complete denials). This is a rate of one birth out of 300 during the study period. Twenty-four children were excluded: 14 for premature birth, four for stillbirth, two for anonymous birth, and four mothers refused to take part in the study. Out of the 51 children included in the study, 16 were of mothers undergoing complete denial of pregnancy and 75 from mothers partial denial (Fig. 1). The characteristics of the infants at birth are presented in Table 1.

#### 3.1. Follow-up of the children

Fifty-three percent (27/51) of the medical certificates at 9 months and 49% (25/51) of those filled in at 24 months were complete and available.

The answer rate for the phone questionnaire on the children's current medical condition was 80%. The children's median age was  $4.5 \pm 1.5$  year.



Fig. 1. Flow chart.

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