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Original Article

The Relationship Between Caesarean and Neonatal Hypothyroidism in Chadegan City

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Abstract

Background and aims: Hypothyroidism is the most prevalent cause of mental dysfunctions. The rate of this problem in Iran is higher than the average rate of the world. Other studies have shown different prevalence rates of this disease. The aim of this study was to investigate the effect of caesarean operation on the increase of hypothyroidism.

Methods: This study was a case-control study performed on the newborns in Chadegan County during 2016-2017. The number of cases (TSH >3.5) was 84 and the number of controls (TSH ≤3.5) was 176. After matching at individual and group levels,analysis was done based on odds ratio and the confidence interval.

Results: This study showed that there was no relationship between caesarean and hypothyroidism (odds ratio [OR] = 1.235) with the confidence interval of 0.73-2.08.

Conclusion: This study did not show any relationship between caesarean and hypothyroidism and therefore the role of other risk factors especially genetic and environmental risk factors should be emphasized. Other studies also reported such relationship.

Keywords: Caesarean, Hypothyroid, TSH, Congenital hypothyroidism

Introduction

Congenital hypothyroidism is a problematic situation with the function of the thyroid gland in newborn infants, causing a thyroid disorder. Therefore, the level of thyroid hormone in infants' blood is low. This disease is the most prevalent cause of mental dysfunctions. In most cases, hypothyroidism causes no morbidity, because the mother's thyroid hormone is tranfered from placenta to the fetus. Hence, there is no specific sympom of the disease.[1] As symptoms of the disease are observed in the first 3-6 months of life, late diagnoses will indispensably cause a drop in IQ. During the first 3 months of life, some prevalent side effects of disease such as constipation, yellow skin, dry skin, big tongue, heart failure and growth delay can be observed.[2] The prevalence of hypothyroidism is different in the whole world. Table 1 showes the incidence of neonatal hypothyroidism in some countries in the world.[3]

Some studies show the increased prevalence of hyportheoidism. For instance, the incidence rate of hypothyroidism in the United States was 1 per 4000 newborns in 1987 and 1 per 2372 in 2002.[4] Some factors cause an increase in the incidence of hypothyroidism, for example, migration of Asians to the United States, more chance to remain alive and increase in the number of infants and giving birth to twins.[4] Hypothyroidism is high in Asian races.[5]

Whole risk factors and predisposing factors, according to different studies, are classified in 4 groups[6-10]:

1. Mother factors: age of mother (up to 40), number of caesarean deliveries
2. Infant factors: baby's weight (less than 2000 g), gender
3. Environmental factors: areas that have deficiency in iodine
4. Genetic factors

Based on the reports, the prevalence of hypothyoidism varies among different areas of Iran. Azizi et al reported that the prevalence rate of hypothyroidism was 1 per 914 infants in Tehran province. Karimzadeh et al reported that the rate of hypothyroidism in Fars province was 1 per 1433 Infants and Hashemipour et

al reported that the prevalence rate of hypothyroidism was 1 per 748 newborns in Isfahan province during 2001-2006.[11,12] The reports showed that the prevalence rate of hypothyroidism was 1 per 638 infants in Iran in 2005 which caused the commencement of the programs for the prevention and treatment of thyroid diseases.[13] According to the reports, some factors affect the hypothyroidism in Iran. Iodine deficiency in some areas, exposure to high density of povidone-iodine (Betadine), consanguineous marriages and other genetic and environmental factors are the examples. Different studies emphasize the role of both iodine and caesarean in increasing the incidence of hypothyroidism.[13] This study was designed attending the high prevalence of hypothyroidism and the need for decreasing its incidence. Thus, the aim of this study was to investigate the effect of caesarean operation on the increase of hypothyroidism.

Materials and Methods

This study was a case-control study. The cases of this study were the infants who had hypothyroidism (born with TSH>3.5) and the control group included the infants who had lower level of TSH (TSH <3.5). Matching was done in two levels: Individual matching was done based on the place of residence, genetic factors, and geographical factors; and group matching was done based on the income, literacy, and the age of mothers. The infants of both groups were born in the Chadegan county during 2016-2017. Infants were selected based on random sampling using table of sampling. The validity and reliability of checklist were already confirmed, as the data were extracted from Newborn Screening Program (NSP). The case group included 84 infants and the control group had 176 infants. The data of the study were entered into SPSS (version 18.0). Descriptive analysis was performed using chi-square test, logistic regression, and odds ratio (OR).

Results

The whole number of infants in this study were 260 (50% girls, and 50% boys). The whole number of infants with a normal level of TSH was 176 (67.7%), while 84 (32.3%) infants in the case group had high level of TSH. The mean age of mothers in 2 groups was 27.5 years. Mothers were between the ages 16 and 42. The mean income (both salaries and wages) in both groups was 4 680 000 Rials per month. The mean age of mothers in the case group was 27.4 years and in the control group was 28 years. The mean income (both salaries and wages) in the case group was 4 380 000 Rials and the median was 3 900 000 Rials per month. The mean income (both salaries and wages) in the control group was 4 820 000 Rials and the median was 4500000 Rials. Furthermore, the number of normal delivery was 130 cases (50%) and the number of caesarean section was 130 cases (50%) in both groups. The main finding of this study was based on the odds ratio. Table 2 shows the relationship between the caesarean (independent variable) and hypothyroidism (with the rate of TSH as dependent variable).

According to Table 2, the odds ratio (OR = 1.235) and the confidence interval (95% CI) were between 0.73-2.08.

The results of this study and the rate of OR showed that caesarean had no impact on hypothyroidism in infants and there was no significant relationship between independent and dependent variables.

Discussion

As we mentioned before, there was no significant relationship between caesarean and hypothyroidism (OR=1.23). It seems that other factors beyond caesarean can affect the hypothyroidism. We found that caesarean (independent variable) had no effect on hypothyroidism (dependent available). It may cause temporary hypothyroidism.

Other studies have reported different results

Table 1. Incidence Rate of Neonatal Hypothridism in Some Countries

Country	Incidence of Hypothyroidism	Country	Incidence of Hypothyroidism
Pakistan	1.1	China	1.3
United Arab Emirates (UAE)	1.16	Saudi Arabia	1.2
Turkey	1.29	Kwait	1.34

Table 2. The Number and Percentage of the Case and Control Infants According to the Normality of TSH

Type of Child Birth	TSH		
	High (TSH>3.5)	Normal (TSH<3.5)	Total
Caesarean	45 (17.5%)	85 (32.7%)	130 (50%)
Normal	39 (15%)	41 (35%)	130 (50%)

about the relationship between the hypothyroidism and caesarean. Some studies have found that there is direct relationship between the hypothyroidism and caesarean. For instance, Herbstman et al in a cross-sectional study showed that there was a little relationship between the rate of TSH in infants' blood (hypothyroidism) and caesarean operation.[6] In another study, McElduff et al in a cohort study showed that there was a strong relationship between the caesarean and temporary hypothyroidism. But there was no relationship between permanent hypothyroidism and caesarean.[7] In general, multiple factors including age of mother, birth order, Asian race, low birthweight, gender, geographical area, consanguineous marriages, and exposure to topical iodine prior to caesarean operation may affect hypothyroidism.

Conclusion

Altogether, it could be stated that caesarean can relate with and affect the temporary hypothyroidism, but not the permanent one. Moreover, this study showed that there was no relationship between caesarean and hypothyroidism.

Further epidemiological research is required to ellucidate the impact of factors such as cesarean delivery on congenital hypothyroidism.

Ethical Approval

The whole factors, documents and checklists were confidential and no one was permitted to know their information.

Conflict of Interest Disclosures

None.

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