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# Incidence of Congenital Heart Disease in Pediatric Age Group Following Maternal Use of Luteal Supportive Hormonal Therapy During Pregnancy

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**Abstract.** The most prevalent birth abnormality, congenital heart disease (CHD), affects 9.4 out of 1000 babies, Certain medications, such as phenytoin, lithium, amphetamines, warfarin, oestrogen, or progesterone, have been shown to raise the risk of congenital heart disease in offspring when used by the mother during pregnancy**.** Identify the incidence of Congenital Heart Disease in pediatric Following Maternal Use of luteal supportive Hormonal Therapy During Pregnancy**.** Retrospective research was conducted at a private cardiologist's clinic between February 12 and May 1, 2025. A pre-tested questionnaire was used to interview the mother or caregiver of each kid. It asked about the mother's medical history about associated conditions, the child's sociodemographics, and whether the mother had taken luteal supporting hormone during pregnancy. The kind of CHD and the history of progesterone usage (time, duration, and route) were ascertained by echo. This study regarding socio-demographic characteristics and showed that females were more than males (55%, 45%, respectively), found that 71.76% of the patients were under one year old, VSD was the most prevalent kind of CHDs in this study (28% of the cases), also, study reflect positive correlation between progesterone and CHD. Conclude of study result most of child with CHD was less than 1 years in age and there is associate between maternal progesterone intake and fetus born with CHD.

**Highlights:**

1. Ventricular septal defect (VSD) was the most common congenital heart disease observed, accounting for 28% of cases.
2. A positive correlation was found between maternal progesterone intake during pregnancy and the occurrence of CHD in offspring.
3. Most affected children were under one year old, with a slight female predominance (55%).

**Keywords:** Congenital heart disease, progesterone, risk factors

## Introduction

The most prevalent birth abnormality, congenital heart disease (CHD), affects 9.4 out of 1000 babies [1]. Survival has significantly increased as a result of significant

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advancements in diagnostic techniques as well as in the medicinal, surgical, and endovascular treatment of CHD over the past few decades [2]. With 90% of children with CHD living into adulthood, there are now more adults than children with the condition because to advancements in pediatric cardiology treatment and congenital heart surgery [3]. There is a considerable risk of maternal and fetal morbidity when CHD occurs during pregnancy [4]. Pregnancy-related congenital heart disease (CHD) increases the risk of complications, length of hospital stay after delivery, and readmission after discharge. Heart failure, arrhythmia, thromboembolic illness, endocarditis, pre-eclampsia, or bleeding are examples of maternal problems [5,6].

Certain medications, such as phenytoin, lithium, amphetamines, warfarin, oestrogen, or progesterone, have been shown to raise the risk of congenital heart disease in offspring when used by the mother during pregnancy [7]. When pregnant, these drugs should be avoided at all costs, and women of reproductive age should get the appropriate counseling. Furthermore, some medications must have safety warnings, such as sodium valproate for women and girls [8].

About 8 out of every 1000 live newborns have congenital heart disease (CHD), although only 2-3 of those babies will exhibit symptoms in the first year of life. With the exception of MVP, PDA in preterm newborns, and bicuspid aortic valve (which typically manifests in 1%–2% of adults), the prevalence is higher in stillbirth (3–4%), spontaneous abortions (10–25%), and premature infants (2%).[9] More than 90% of people with trisomy 18, 50% of people with trisomy 21, and 40% of people with Turner syndrome have CHDs. The causes of the majority of CHDs are still unclear, and many of the many forms of CHDs are complicated and result from a combination of genetic predisposition and environmental stimulation.[10]

It was postulated that environmental factors influence a person's genetic susceptibility to the deformity and that exposure must take place during the first eight weeks of pregnancy, when the heart is developing.[11] CHDs are linked to a number of risk factors, such as the teratogenic effects of medications during pregnancy. For instance, several anticonvulsant medications change the metabolism of folate in the early stages

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of pregnancy, which can result in neural tube defects and congenital heart disorders.[12]

Despite the encouraging safety profile from clinical trials, there has been concern expressed about a possible link between early prenatal exposure to dydrogesterone and congenital heart abnormalities (CHD) in the fetus (13). Additionally, a recent Chinese study found a link between stillbirth and birth abnormalities (14,15). Given the clinical evidence supporting the notion that mothers of cardiac infants exhibit an excess of abnormal reproductive traits, it seemed plausible to hypothesize that endocrine imbalance might impact fetal development during the process of conotruncal structure differentiation. Therefore these study aimed to identify the incidence of Congenital Heart Disease in pediatric Following Maternal Use of luteal supportive Hormonal Therapy During Pregnancy.

## Methodology

This retrospective research was conducted at a private cardiologist's clinic between February 12 and May 1, 2025. A pre-tested questionnaire was used to interview the mother or caregiver of each kid. It asked about the mother's medical history about associated conditions, the child's sociodemographics, and whether the mother had taken luteal supporting hormone during pregnancy.
The kind of CHD and the history of progesterone usage (time, duration, and route) were ascertained by echo.

The data were analyzed using the SPSS IBM, version 27. Data entered and managed using descriptive statistics (frequency distribution and percentage) and inferential statistic (the Chi-square test was used to test association between categorical variables, while t student test was used to compare the means of quantitative continuous variables). P-value of <0.05 considered statistically significant and Odd's ratio was calculated.

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## Result

**Table 1.** The study participants' sociodemographic attributes (n = 60)

| Variables | Category | Frequency | Percent- age % |
|---|---|---|---|
| Age of child/ months | Mean = 10.65<br>SD= 2.12 | | |
| Age of mothers/ years | Mean= 29.23<br>SD= 3.55 | | |
| Sex | Male | 27 | 45.0 % |
| | Female | 33 | 55.0% |
| Progesterone therapy | Yes | 26 | 43.33% |
| | No | 34 | 56.34% |
| Family history | Positive | 12 | 20.0% |
| | Negative | 48 | 80.0 % |
| Type of CHD | No | 18 | 30.0% |
| | VSD | 15 | 25.0% |
| | ASD | 12 | 20.0% |
| | Combination | 5 | 8.3% |
| | Others | 10 | 16.66 |
| Route of drug administer | Oral | 6 | 23.07% |
| | Injection | 4 | 15.38% |
| | Supp | 12 | 46.15% |
| | Combination | | 15.38 |

**Table 2.** correlation between progesterone and occurrence of CHD

| **Progesterone** | ***R*** | **P.value** |
|---|---|---|
| **CHD** | **0.68** | **0.087** |

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**Table 3.** correlation between progesterone and type of CHD

| **Progesterone** | ***R*** | **P.value** |
|---|---|---|
| **VSD** | **0.8** | **0.05** |
| **ASD** | **0.54** | 0.67 |
| **Combination** | **0.9** | 0.88 |
| **Others** | 0.23 | 0.53 |

## Discussion

This study regarding socio-demographic characteristics and showed that females were more than males (55%, 45%, respectively), another study conducted in Karbala/Babylon, Iraq, also showed female predominance (56.6% of the cases) [16]. Regarding the child age was (mean = 10.56 months) This is in line with a study conducted in Ramadi, Iraq, which found that 71.76% of the patients were under one year old, while another study conducted in the same city found that 68% of the cases were under one year old [17, 18]. VSD was the most prevalent kind of CHDs in this study (28% of the cases), which is in line with a study that revealed VSD to be the most prevalent type (38.3% of the cases) in Karbala/Babylon, Iraq [16].

Early progesterone intake during pregnancy raises the offspring's risk of CHDs, particularly VSD, by five times.[19] While another study conducted in the Gaza Strip found that 37% of mothers of children with congenital heart defects and 18% of mothers of controls were exposed to hormonal treatment during pregnancy, indicating a positive association between hormonal treatment and congenital heart defects, this study found that 40% of cases and 48% of controls confirmed the use of maternal hormones during pregnancy, indicating no significant relationship between CHDs and hormonal treatment [20]. Therefore, it is imperative that pregnant women and healthcare professionals learn more about the dangers of progesterone and limit its use during the first trimester unless there is a

According to this study, offspring CHD was linked to the mother's hormone medication during pregnancy. Nonetheless, two sizable population-based cohort studies [21,22]

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have found that mothers who have previously had hormonal therapy are more likely to give birth to children who have congenital heart disease.

The case control research from Gaza [23] was in line with the elevated incidence of cardiovascular abnormalities. About twice as many heart problems were observed in newborns exposed to hormones during pregnancy in a number of earlier investigations that connected hormones to congenital heart malformations (24,25). After hormonal pregnancy testing, the data showed a prevalence ratio of roughly 1.7 for heart abnormalities, whereas another study was regarded as showing no connection (26). Although each study was consistent with a little positive relationship, other investigations found no association (27–28).

## Conclusion

as conclude of study result most of child with CHD was less than 1 years in age and there is associate between maternal progesterone intake and fetus born with CHD

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