

# Ultrasound Diagnosis of Intrauterine Anencephaly Due to Maternal Exposure to Concomitant Drug-Herbal Medications: A Case Report

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## Abstract

Anencephaly is a severe form of neural tube defect (NTD) in a fetus, leading to incomplete development of the brain and spinal cord. This study reports, for the first time, an intrauterine anencephaly due to maternal exposure to concomitant conventional drugs and herbal medications. We report the case of a 25-year old woman who had a history of profuse bleeding in her first trimester, and was subjected to medications (drugs/herbs) to mitigate the bleeding. She had no history of folic acid intake. She did not attend antenatal clinic. Ultrasound study revealed a viable singleton intrauterine fetus without fore-brain, with bulging eyes giving "a frog eye sign" suggestive of anencephaly. There were associated polyhydramnios and shortening of the long bones, which are common findings in fetus with anencephaly.

**Keywords:** Anencephaly; Neural Tube Defect; Intrauterine; Drug, Herbal Medicine; Ultrasound

## Introduction

Anencephaly is a severe form of neural tube defect (NTD) which is caused by a failure of the closure in the cranial neuropore. It occurs between the third and fourth week of gestation, which results to the absence in the formation of major portion of the brain, skull and scalp [1,2]. There is lack of part or the entire cerebrum of the brain, which exposes the remaining brain tissue to injury from the amniotic fluid. The neural tube normally closes between 23 and 27 days after conception. The failure of the neural tube to close leads to the developmental failures of a major portion of the brain including the skull and scalp [2]. Ultrasound detection of anencephaly is virtually 100% [2]. The exact cause of anencephaly and other NTDs is quite unknown; however, socioeconomic status, environmental conditions, and genetics are reported [3]. Animal studies have consistently shown that some herbal medicines cause fetal malformations and threatening miscarriages [4]. Another study showed that women using herbal medicines during pregnancy had higher incidence of threatening miscarriage, and new borns of herbal users were smaller for their gestational age [5].

There are no reports linking the combination of herbal medicines and drugs to anencephaly. Hence, the present study report a singleton intrauterine fetus with associated anencephaly at 34 weeks gestation.

## Case Presentation

A 25-year old pregnant woman presented to the radiology department for an obstetric ultrasound examination. She was referred from a primary health center located in a village. Her clinical history stated that she had significant bleeding in her early pregnancy, which was suspected to be threatening miscarriage. During the course of interaction with the patient, she said that she was given some medications by the village health attendants to arrest the bleeding. She could not provide the names of the medicines. She also mentioned that her husband who had no knowledge of drug-prescription exposed her to local herbal medicines. She mentioned that she took large dosage of both the orthodox and the herbal medicines respectively. All these medications were given to her in her early pregnancy, when the bleeding was very severe. Due to the poverty situation of the patient's family, she could not register or enroll for antenatal clinical activities. She was not given any folic acid medication.

The obstetric ultrasound scan revealed a viable singleton intrauterine fetus in a longitudinal lie and cephalic presentation. There were normal fetal body movement and cardiac activity. The fetal heart rate was 132 bpm. However, there was absence of the forebrain with associated bulging of both eyes, which gave a “frog eye sign” suggestive of anencephaly (Figure 1). The amniotic fluid volume was markedly increased (Amniotic Fluid Index (AFI) = 26.78 cm), suggestive of polyhydramnios. The deepest fluid pockets recorded high values (Figure 2). The placenta location was at posterior-fundal. The femoral length (5.79 cm, gestation = 30 weeks 2 days) measurement indicated small for gestational age, likely due to intrauterine growth retardation (IUGR), compared to the abdominal circumference (30.10 cm, gestation = 34 weeks). The fetal weight was 2078g. The ultrasound gestational age was 32 weeks.



**Figure 1:** Shows two rounded anechogenic structures giving a frog eye sign, indicative of the bulging of the both eyes, marked by “x”



**Figure 2:** Shows the first and second quadrants which gave the increase in the amniotic fluid index (AFI), suggestive of polyhydramnios

## Discussion

The study correlated the patient’s clinical history and the findings with the study which showed that herbal medicines are linked to fetal anomalies [4,5]. The primary health care attendants demonstrated lack of basic knowledge on the indications for use and safety of concomitant use of drugs and herbal medicines in pregnancy, which was in line with the study by Smeriglio, *et al.* [6]. All medicines have potentially unexpected effects including toxicity and herbal medicines are not excluded [7]. Herbal medicines cause more adverse reactions than conventional drugs because they possess whole extracts, and they contain numerous active ingredients of varying concentrations [8]. Most of the herbal medicines are been produced under poor conditions in which there is high risk of contamination or tampering with the addition of toxic metals, undeclared plants or synthetic drugs [8-10]. Apart from the potential adverse effects of herbal medicines, they have shown to be teratogenic in humans and animal models [4,11-16]. The study when compared with other studies, showed polyhydramnios to be a common prenatal finding in a case of anencephaly [17-19]. This study showed that shortening of long bones is also a common finding associated with anencephaly, which may suggest IUGR as a result of maternal substance abuse [19, 20]. The patient did not have any history of iron or folic acid intake, due to non-antenatal clinical attendance. This could not prevent the teratogenic effects of the concomitant drugs and herbal medicines on the fetus.

## Conclusion

The concomitant use of conventional drugs and herb medicines has shown to cause NTD; anencephaly. It is shown that due to varying concentration and poor condition of herbal medicines, the risk of teratogenic effects on the fetus will be high. Polyhydramnios and shortening of long bones have shown to be among the common findings associated with anencephaly.

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