

Folic Acid Supplementation in the Prevention of Neural Tube Defects: A Case Report of Anencephaly

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ABSTRACT

BACKGROUND

Neural tube defects is the failure of neural tube closure during embryogenesis resulting in a congenital malformation. When this defects occur in the cranial region Anencephaly results. We report a case of an unbooked G2P1⁺⁰ woman who delivered a baby with anencephaly without any history of folic acid intake prior to or during the course of the pregnancy. Subsequently she had preconception care and folic acid was given for a period of 3months before conception. She delivered a set of twin babies without any neural tubes abnormality.

AIM

To use this case report to advocate the importance of folic acid intake prior to conception and during pregnancy in preventing neural tube defects.

CASE REPORT

Mrs O.J. is an unbooked 29-years old Gravida 4 Para 2+1 woman, who delivered a baby with anencephaly. She was started on folic acid during preconception care and however had delivery of a set of twin and no fetal anomaly noted.

CONCLUSION

Preconception folic acid intake is important in the prevention of neural tube defects.

KEYWORDS

Neural tube defects; Folic acid; Anencephaly; Preconceptional care

INTRODUCTION

Neural tubes defects (NTD) are congenital malformations of the cranium or spine that result from failure of normal neural tube closure during early pregnancy [1]. This

defects affect more than 300,000 newborns worldwide [2], as early as 4 weeks in pregnancy when most women do not even know they are pregnant. Jufen Liu et al. [3] found a recurrence rate was 1.5% and 2.6% for those

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taking folic acid supplements and without folic acid supplementation respectively.

Folic acid is an essential water soluble vitamin B in diet gotten from fruits and vegetables. The conversion of homocysteine to methionine requires methylation provided for by folic acid. This is an essential element in neurulation.

CASE REPORT

Mrs. O.J., a 29-year-old unbooked G₂Para1⁺⁰ with 1 living male child, at a gestational age of 38 weeks, presented to Semino Hospital and Maternity, Enugu on 30th September, 2019 on account of lower abdominal pain and passage of show of 12 hours prior to presentation. Her Symphysiofundal height was 42 cm which was not compatible with her gestational age of 38 weeks. The cervix was 4 cm dilated at presentation and contraction was about 3 in 10 minutes lasting 30 seconds. The labour progress was eventually adjudged to be poor and it was augmented oxytocin. She eventually had a vaginal delivery of a macerated, anencephalic female stillbirth.

An ultrasound scan done at 28 weeks gestational age revealed anencephalic fetus.. There was no history of intake of folic acid or formal antenatal care during course of pregnancy or prior.

She however, conceived again but had a missed abortion at about 12 weeks gestational age. She did not get any folic acid and did not have any pre-conceptual or antenatal care in this index case.

She was however, counseled adequately on the need for preconceptional care and folic acid supplementation prior to conception and she adhered. She had a 5 mg daily folic acid for 3 months prior the next pregnancy. The pregnancy was spontaneously conceived and carried to term. Folic acid supplementation was continued from the preconception period till delivery.

She formally booked for antenatal care in our centre at gestational age of about 12 weeks. Booking investigations were all normal. An ultrasound scan done at 20th week of gestation revealed a dichorionic-diamniotic twin gestation with no fetal anomaly. The antenatal period was uneventful.

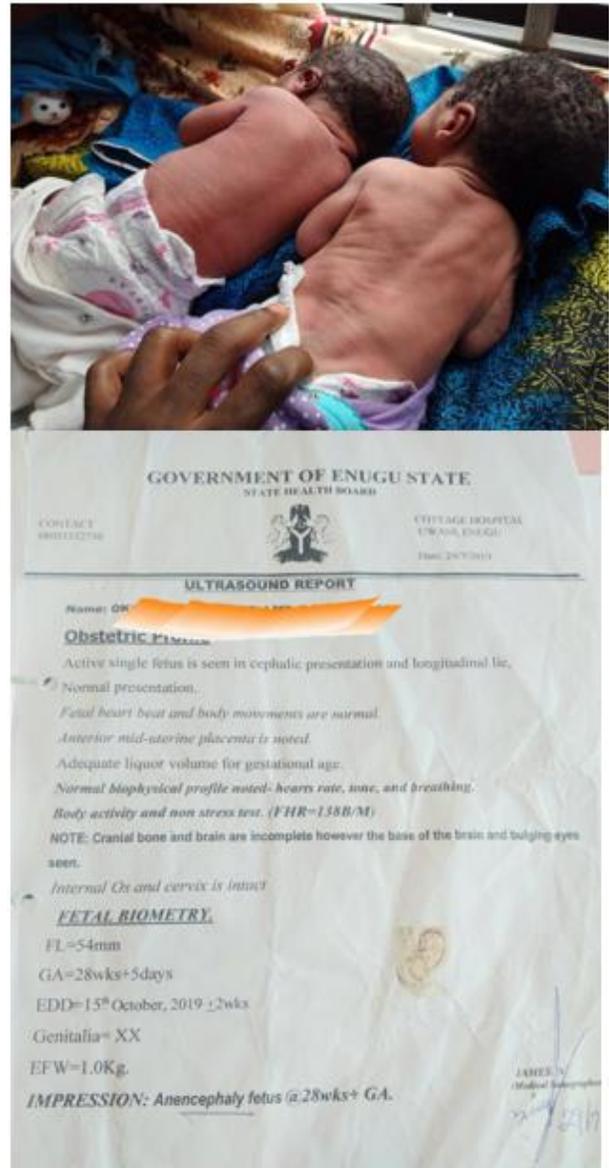


Figure 1: Ultrasound report.

At term, the leading twin was found to be in breech presentation and she subsequently had an elective caesarean delivery at 38th week with an outcome of two live neonates: Twin 1, a female neonate that weighed 2.6 kg and twin 2, a male that birth weight 3 kg all with good

apgar scores. There was no fetal anomaly noted (Figure 1).

DISCUSSION

The congenital malformation that results when there is failure of neural tube closure during embryogenesis is neural tube defects. When this defects occur in the cranial region it results in anencephaly. Cranial defects are lethal as they not compatible with life. Other forms of this defects include spina bifida, etc.

Anencephaly is the congenital absence of a major portion of brain, skull and scalp. It results from defective neurulation process. Neurulation is the process of neural tissue formation from ectoderm. Anencephaly results from failure of neural tube closure at the cranial end of developing embryo leading to incomplete calvaria and brain [4]. Babies with this condition are still borns or die shortly after birth, while a child with spina bifida can survive depending on severity.

In nucleotide synthesis folic acid are involved in the methylation of homocysteine for DNA replication which in turn largely involved in neurulation [2]. A disruption of DNA methylation will result in neural tube defects.

Richard Smithells et al observed that women who gave birth to babies with neural tube defects had low folic acid in the blood [5].

The WHO guideline on prevention of neural tube defects says that 'all women from the moment they begin trying to conceive until 12 weeks gestational age should take folic acid supplement. Women who have fetus diagnosed as affected by neural tube defects should receive information on risk of recurrence be advised on protective effect of periconceptional folate supplementation and be offered high dose supplementation [6].

US CDC recommends that women of childbearing age consume 400 mcg of folic acid daily before conception and continue in pregnancy [7].

In a case study done by Mohammed Bager Hosseini et al. in the University of Medical Sciences Iran where the association between folic acid use and occurrence of neural tube defects in a group of women and referred for therapeutic termination of pregnancy [8]. Guatam Bishnu concluded in his case report that prenatal counseling, adherence to folic acid supplement and regular follow-up can prevent further complications arising from neurulation processes [9]. The findings indicated that folic acid use before and after conception may have role to reduce rate of neural tube defects in the region.

CONCLUSION

Preconceptional folic acid intake is essential in the prevention of neural tube defects.

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