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Neural tube defects: An Obstetrician's concern

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ABSTRACT

Screening for neural tube defect is a universal procedure that doesn't require any criteria; but the intervention method is altered. Folic acid intervention is the proven method and a good ultrasound is the simple equipment to screen.

Keywords: birth defects, folic acid, screening, ultrasound

COMMENTS

Birth defect of brain and spinal cord is called the neural tube defect (NTD) and 70% of it can be prevented with a simple proven intervention like Folic acid (Vitamin B9) supplementation. This defect is the event of first month of pregnancy; thus, the intervention would be missed prior to knowing the pregnancy. NTD screening is the universal procedure since it occurs in 90-95% cases without known risk factors.¹

Causes of NTDs are genetic, environmental and autoimmune factors by disrupting the neural tube closure pathways.^{2,3} Malabsorption syndrome, nutritional deficiency, hemolytic anemia, antifolate medicines (like antiepileptics and methotrexate) and Diabetes mellitus may cause NTDs.^{4,5} Febrile illness during pregnancy and obesity may also result in miscarriage and birth defect especially NTD, cardiac and lip defects.^{6,7}

Supplementation of 400mcg daily from one month prior to pregnancy through 12 weeks; and from 3 months before pregnancy with 10 times more dose if high risk (history of NTD in either partner) for NTD.^{8,9} Folic acid, alone or in combination with vitamins and minerals, prevents NTDs, but does not have a clear effect on other birth defects.¹⁰

The red blood cell folate threshold can be used as a population level indicator of folate insufficiency in women of reproductive age and should be above 400 ng/mL (906 nmol/L). Folate concentration <3ng/mL in serum and <100ng/mL in RBC are likely to be indicator of folate deficiency resulting in megaloblastic anemia. There is less biological variation in RBC folate level.¹¹ To prevent NTDs where the pregnancy occurs unnoticed, the multivitamin B combined with choline, betaine and *n*-3 PUFAs supplementation may have a better protective effect against NTDs than folic acid alone.¹²

High resolution

ultrasonography alone at 11-14 weeks (TVS) and 18-20 weeks (TAS) would be better than MSAFP to detect NTDS and trisomy 18 and 21 as well.^{13,14,15} MSAFP assay is less sensitive in first trimester; so, it can be performed from 15 weeks through 20 weeks.¹⁶

CONCLUSIONS

Screening of neural tube defect should be a routine practice for the obstetrician and the Folate supplementation is the must to start prior to one month of pregnancy to prevent it. A good resolution ultrasound would be better than the biochemical markers as the screening tools.

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