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PREVENTION OF NEURAL TUBE DEFECTS BY FOLIC ACID IN PREGNANCY.

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Pakistan is a developing country facing variety of challenges including maternal malnutrition and neonatal mortality. Globally Pakistan has the third highest neonatal mortality rate(1). Maternal malnutrition contributes to low birth weight neonates and birth anomalies. A study conducted in tertiary care hospital of Karachi catering to lower socioeconomic background showed 10.9% of birth defects to be of central nervous system. Maternal factor related to neural tube defects in same study showed 81.3 % mothers had not taken folic acid during pregnancy(2) .

Neural tube defects are birth defects of central nervous system. Spina bifida is a term used for group of birth defects (meningocele, myelocele, meningomyelocele, myelomeningocele). These birth defects are a result of an incomplete closure of spinal column causing herniation of spinal cord or meninges. Neural tube defects are multifactorial with genetic and environmental causes. Genetic factors are contentious with unknown pathophysiology(3). Environmental factors can be managed by prevention of folic acid deficiency and avoiding consanguinous marriages. One of the most important nutritional factors related to the advent of spinal dysraphism is the lack of folic acid. Augmentation of folic acid may reduce neural tube defects drastically.

Folic acid is a vitamin which is cheaply available in market. Dietary intake of folic acid in early pregnancy can reduce neural tube defects upto 72%. Due to unawareness pregnant women belonging to rural areas where maternal healthcare is scarce, folic acid is not incorporated in diet leading to CNS birth defects. Poor nutrition and unavailability of health facilities are burdening more pain to the family & society.

Systemic review and meta-analysis of global birth prevalence of Spina bifida by folic acid fortification status showed the lower prevalence of Spina bifida in studies where folic acid fortification was compulsory (33.86 per 100,000; 95% CI=31.05, 36.92) compared to increased prevalence of Spina bifida in studies where folic acid fortification was voluntary or non existent (48.35 per 100,000; 95 % CI=41.07, 56.93)(4).

PUSH! A Global Alliance, that provide country and regional indicators snapshots for Spina Bifida & Hydrocephalus Surveillance. According to their report cards, efforts are required in Pakistan for availability of population based folate studies, surveillance for prevalence & mortality of spina bifida and hydrocephalus, prevention based policies, access to care of affected people and quality of life associated with spina bifida(5).

PREVENTION IS BETTER THAN CURE a very famous saying is a fit statement for this problem.1 mg folic acid is an essential pre pregnancy nutrient for every woman planning to conceive it helps in reducing the risk of neural tube defects.5 mg of folic acid is required daily in women with higher risk of having a pregnancy affected by neural tube for at least a period of 12 weeks where foetal spine is developing or previous history of giving a birth to a child with neural tube defect.

To diagnose neural tube defect during pregnancy a good quality & high resolution Ultrasound, MRI, Serum alpha feto protein, Amniotic alpha feto protein are required. The most commonly used is ultrasounds as other test like maternal alpha feto proteins may not be reliable or may not be positive even in amniotic fluid when the fetus is having a covering defect like spina bifida Occulta.

MRI is cumbersome due to claustrophobia or size of gantry does not allow pregnant ladies with large bellies to enter inside MRI machines. MRI is not commonly available and advised by the physicians. So high resolution and good quality ultrasound may help in early detection of the defect between 12 to 16 weeks of gestation would be ideal for

termination of pregnancy.

So our recommendation is fortification of folic acid in daily grains or flour would do the trick, as in all advanced health care world the folic acid is already fortified in grains, cereals and flour for the last decade or so. Specifically every married girl who is trying to conceive should take folic acid before conception. Government should make policies to incorporate folic acid in flour and cereals. Awareness sessions and campaigns on national television and social media about folic acid deficiency are needed. This burden of morbidity and mortality associated with neural tube defects will decrease by folic acid in flour.

Pakistan today need a healthy nation to develop and build a better Pakistan.

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Atiq Ahmed; Concept, data collection, data analysis, manuscript writing, manuscript review