
Research Article

Prevalence of Women Taking Folic Acid During Pregnancy and its Impact on Child's Birth Weight in Duwakot, Nepal

Raut Binod¹, Kharel Sushil², Kela Anil Kumar³

¹Department of Pharmacology,

²Department of Physiology,

³Professor and HoD,

Department of Pharmacology, Kathmandu Medical College and Teaching Hospital, Kathmandu, Nepal

Corresponding Author: Binod Raut

Abstract:

Introduction: Pregnancy is a crucial period with increased metabolic demands. Vitamins, minerals and folic acids are the major determinants of not only the child's health but also the pregnant woman.

Objective: To evaluate maternal intakes of folic acids during pregnancy and assess its impact on child's birth weight.

Materials and methods: A cross-sectional study was conducted among 395 women with live birth in Duwakot of Bhaktapur, Nepal. In this study, maternal intake of folic acid during pregnancy was assessed by a questionnaire and birth weight of child was verified by the certificate issued by the Hospital. The correlation between these intakes and birth weight were evaluated and analyzed.

Results: Prevalence of women taking folic acid during pregnancy was 69.87%. This study found the positive effect of the folic acid intake of mothers on birth weight of their child, 80.07% of child with normal birth weight were the child whose mothers took folic acid during the pregnancy whereas only 37.18% child were of normal birth weight whose mothers were not taking folic acid during pregnancy. Folic acid intake during pregnancy was significantly correlated with birth weight ($P < 0.05$).

Conclusion: Intake of folic acid by mothers during pregnancy was strongly related to normal birth weight of the child. So awareness campaign on folic acid intake and other vitamins during pregnancy should be emphasized to make our society healthy with normal birth weight child.

Keywords: *Folic acid, Child birth weight, Duwakot.*

INTRODUCTION

Folic acid (FA) has been shown to be effective in decreasing the risk of neural tube defects (NTD).¹ Folic acid plays a significant role in the physiological metabolism of nucleic acid synthesis and cell division.² During pregnancy, folic acid intake is essential for rapid cell and tissue growth of the placenta and the uterus, growth of the fetal child and increment of the maternal blood volume.³ During pregnancy, folic acid requirements are 5- to 10-fold higher so pregnant women may be at the vulnerable risk for folic acid deficiency during pregnancy.⁴ Daily prenatal use of iron with folic acid remarkably improves child's birth weight, eventually reducing the risk of Low birth weight.⁵ Folic acid supplementation is recommended before conception, to prevent development of spina bifida and other neural tube defects. It should be consumed at least 0.4 mg/day during the first trimester of pregnancy, 0.6 mg/day during the pregnancy, and 0.5 mg/day during breastfeeding with other eating foods rich in folic acid.⁶ Folic acid deficiency might result in abnormal cellular growth and the effects are shown most on those tissues which grow

most rapidly.⁷

A good review by Fekete et al.⁸ stated that an effect of FA supplementation on absolute birth weight. The Generation R study has found that the lowest folic acid levels are mostly associated with lower placental weights and birth weight.^{9,10}

Studies have focused on a positive association between the consumption of iron- folic acid supplements during pregnancy and birth-weight of child. Two follow-up studies of cluster randomized controlled trials from Nepal and China had evaluated the long term impact of iron-folic acid supplements on the physical growth status of children. A study from Bangladesh found a significantly higher incidence of childhood stunting in children whose mother did not use IFA (Iron-Folic acid) supplementation during pregnancy.¹¹⁻¹⁴

2. METHODS

This was a cross-sectional study conducted in Duwakot after obtaining ethical clearance from Institutional Review

Committee (IRC) of Kathmandu Medical College. The study was conducted in May-June, 2017. Before the examination, the purpose of the study was explained to all the participants and informed written consent was taken from the mothers before collecting any form of data. For the study, 395 mothers with live birth of different age group were selected randomly from different wards of Duwakot, Bhaktapur. The mothers were given self designed structured questionnaire. Hospital records for child's birth weight were taken. During primary selection, all the subjects were interviewed thoroughly to know their medical history, food habits, economic status etc. Child under 2500 gm at the time of birth was considered as low birth weight.¹⁵ All the mothers with live birth and who were cooperative were included in the study. The data was analyzed using SPSS version 21. Chi Square test was done to predict the P value. P < 0.05 was considered statistically significant.

3. RESULTS

In our study, the mean age of mothers were 27± 3.56 those taking folic acid during pregnancy and 28± 4.47 not taking folic acid during pregnancy (Table 1). Prevalence of women taking folic acid during was 69.87% (Figure 1). Normal birth weight was seen in high percentage (80.07%) among the mothers who took folic acid during pregnancy. On the other hand, among mothers who did not take folic acid during pregnancy only 37.81% were the child with normal birth weight (Table 2). Even the mothers who took folic acid during the pregnancy gave low birth weight child which was 19.93% (55). This figure was significantly high in child (62.19%) whose mothers did not take folic acid during pregnancy (Figure 2).

Table 1: Physical characteristics of mothers taking and not taking folic acid during pregnancy (N=395).

Variables(mothers)	Mothers taking folic acid (Mean ± SD)	Mothers not taking folic acid (Mean ± SD)
Age(Years)	27± 3.56	28± 4.47
Height(meters)	1.54± 0.34	1.56± 0.25
Weight(Kg)	66± 9.76	64± 10.76

Table 2: Distribution of child birth weight among the study population (N=395).

Variables	No and %	Normal Birth weight (No and %)	Low Birth weight (LBW) < 2,500 g (No and %)	P Value
Women taking Folic acid during pregnancy	276(69.87%)	1(80.07%)	55(19.93%)	P < 0.05
Women	119(30.13%)	45(37.81%)	74(62.19%)	P < 0.05

without taking folic acid during pregnancy				
Total	395(100%)	266(67.34%)	129(32.66%)	P < 0.05

Figure 1: Distribution of women taking and not taking folic acid during pregnancy (N=395).

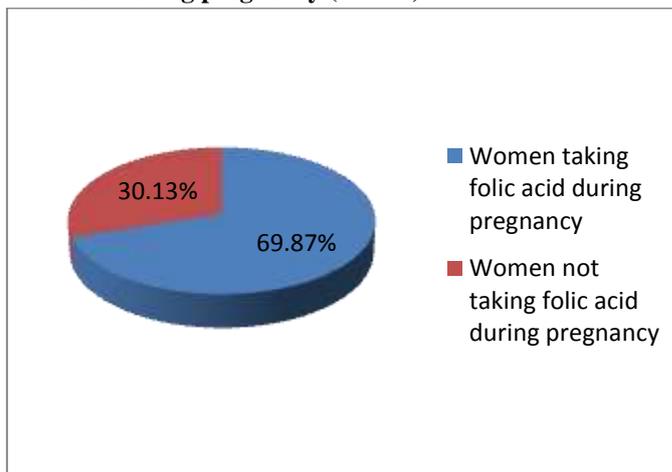
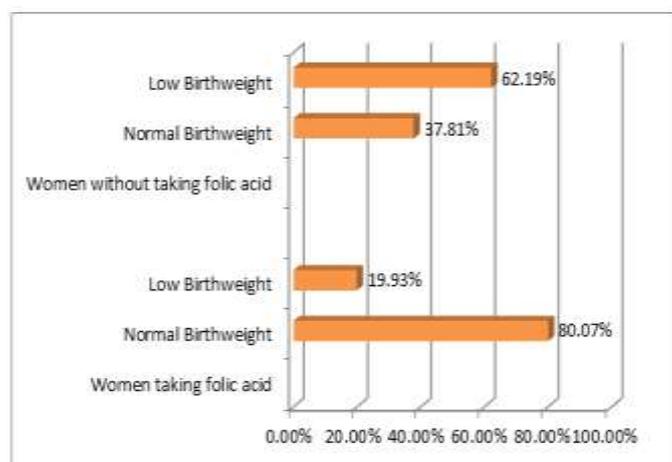


Figure 2: Comparison between the child's birth weight of women taking and not taking folic acid during pregnancy (N=395).



4. DISCUSSIONS

There is a wide range of research which support that folic acid deficiencies directly affect maternal health and child birth weight. The benefits of folic acid with iron were recently stated in the Cochrane review¹⁶. A big nationwide research was conducted to demonstrate the significance of maternal diet and folic acid supplements in altering infant birth weight. Not only folic acid with iron but also daily consumption of milk products and fruits by the mothers were significantly associated with increase in the birth weight of their child compared with the birth weight of children whose mothers never or only occasionally consumed these food items¹⁷. In our study also it showed that normal birth weight was seen in

high percentage (80.07%) among the mothers who took folic acid during pregnancy unlike the mothers who did not take folic acid during pregnancy. Among the latter groups, only 37.81% were the child with normal birth weight.

5. CONCLUSIONS

This study showed a strong association between infant birth weight and the intake of folic acid during pregnancy with other proper food items by the mother. There is a need for a big campaign to improve the nutritional status of pregnant women in a national level. Educating the mothers during pregnancy with her family members to improve their nutritional practices would definitely help to improve mother's health and future outcome of healthy normal birth weight child.

ACKNOWLEDGEMENTS

I express my deep sense of gratitude to my participants without their cooperation this study might not have been successful.

REFERENCES

1. Czeizel AE, Dudas I. Prevention of the first occurrence of neural-tube defects by periconceptional vitamin supplementation. *N Engl J Med* 1992;327:1832–5.
2. Djukic A: Folate-responsive neurologic diseases. *Pediatr Neurol.* 2007, 37: 387-397. 10.1016/j.pediatrneurol.2007.09.001
3. Rondo PH, Tomkins AM: Folate and intrauterine growth retardation. *Ann Trop Paediatr.* 2000, 20: 253-258.
4. Antony AC: In utero physiology: role of folic acid in nutrient delivery and fetal development. *Am J Clin Nutr.* 2007, 85: 598S-603S
5. Haider, BA, Olofin, I, Wang, M; et al. (2013). "Anaemia, prenatal iron use, and risk of adverse pregnancy outcomes: systematic review and meta-analysis". *British Medical Journal.* 21: f3443. doi:10.1136/bmj.f3443.
6. Schaefer, Christof (2001). *Drugs During Pregnancy and Lactation: Handbook of Prescription Drugs and Comparative Risk Assessment.* Gulf Professional Publishing. ISBN 9780444507631. Retrieved 2015-05-13
7. Institute of Medicine (IOM). Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate. Washington, DC: National Academies Press, 2004.
8. Fekete K, Berti C, Trovato M, Lohner S, Dullemeijer C, Souverein OW, et al. Effect of folate intake on health outcomes in pregnancy: a systematic review and meta-analysis on birth weight, placental weight and length of gestation. *Nutr J* 2012;11:75.
9. Bergen NE, Jaddoe VW, Timmermans S, Hofman A, Lindemans J, Russcher H, et al. Homocysteine and folate concentrations in early pregnancy and the risk of adverse pregnancy outcomes: the Generation R Study. *BJOG* 2012;119:739–51.
10. Wang, W.; Yan, H.; Zeng, L.; Cheng, Y.; Wang, D.; Li, Q. No effect of maternal micronutrient supplementation on early childhood growth in rural western China: 30 month follow-up evaluation of a double blind, cluster randomized controlled trial. *Eur. J. Clin. Nutr.* 2012, 66, 261–268.
11. Stewart, C.P.; Christian, P.; LeClerq, S.C.; West, K.P., Jr.; Khatry, S.K. Antenatal supplementation with folic acid + iron + zinc improves linear growth and reduces peripheral adiposity in school-age children in rural Nepal. *Am. J. Clin. Nutr.* 2009, 90, 132–140.
12. Grantham-McGregor, S.; Cheung, Y.B.; Cueto, S.; Glewwe, P.; Richter, L.; Strupp, B. Developmental potential in the first 5 years for children in developing countries. *Lancet* 2007, 369, 60–70.
13. Ministry of Health and Population (MOHP) [Nepal]; New ERA; ICF International Inc. Nepal Demographic and Health Survey 2011; MOHP, New ERA, and ICF International: Kathmandu, Nepal; Calverton, MA, USA, 2012.
14. Black, R.E.; Victora, C.G.; Walker, S.P.; Bhutta, Z.A.; Christian, P.; de Onis, M.; Ezzati, M.; Grantham-McGregor, S.; Katz, J.; Martorell, R.; et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; 38: 427–51.
15. Birth Weight Classification. WHO Statistical Information Systems (WHOSIS). 2011. <http://www.who.int/whosis/indicators/compendium/2008/2bwn/en/index.html>.
16. Pena-Rosas JP, Viteri FE (2006) Effects of routine oral iron supplementation with or without folic acid for women during pregnancy. *Cochrane Database Syst Rev* CD004736.
17. Rao S, Kanade AN, Yajnik CS, Fall CH. Seasonality in maternal intake and activity influence offspring's birth size among rural Indian mothers—Pune Maternal Nutrition Study. *Int J Epidemiol* 2009;38: 1094–103.