correlates of NPAFP to discern explanations for the increase. The incidence of polio AFP in India has decreased. However, the nonpolio AFP rate has increased since 2000. Follow-up of these cases of nonpolio AFP is not done routinely. However, one-fifth of these cases of nonpolio AFP in the state of Uttar Pradesh (UP) were followed up after 60 days in 2005; 35.2% of patients were found to have residual paralysis, and 8.5% had died. This suggests that the pathology in children being registered as having nonpolio AFP cannot be considered trivial. Therefore, there is a compelling reason to try to determine the underlying causes for the surge in nonpolio paralysis numbers.

METHODS: The data on AFP, polio and nonpolio AFP, and number of polio rounds were examined in each state in each year from 2000 to 2013. Multiple linear regression analysis adjusting for region or state, total and female literacy rate, population density, and per-capita gross domestic product was performed. Differences between states and changes over time were analyzed.

RESULTS: NPAFP increased with the number of oral polio vaccine (OPV) doses used (R2 = 25.02%; $P < .001$). When effect of cumulative doses over the previous years was examined, the NPAFP rate in 2013 best correlated with the cumulative doses received in the previous 7 years (R2 = 57.16%), with 2012 excluded because data for this year were incomplete. This correlation was highly significant ($P < .001$). On multiple regression analysis, the number of OPV doses was the only factor that showed a positive correlation with the NPAFP rate. The average increase in the NPAFP rate was 1.31 per 100 000 population ($P < .001$; 95% confidence interval, 1.11–1.52) with each dose of OPV. The NPAFP rate in UP and Bihar, which had consistently increased each year until 2011, decreased in the 2 states in 2012, coinciding with a reduction in doses of OPV administered.

CONCLUSIONS: The incidence of NPAFP was strongly associated with the number of OPV doses delivered to the area. A dose–response relationship with cumulative doses over the years was also observed, which strengthens the hypothetical relationship between polio vaccine and NPAFP. The fall in the NPAFP rate in Bihar and UP for the first time in 2012, with a decrease in the number of OPV doses delivered, is evidence of a causative association between OPV doses and the NPAFP rate.

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Algorithm of Risk Group Formation for Having Children With Neural Tube Defects Among Reproductive-Age Women and Differentiated Approach to Spinal Dysraphia Prevention

BACKGROUND AND OBJECTIVE: Congenital neural tube defects (NTDs) are the most common central nervous system congenital defect and among the most common congenital malformations of all organ systems. NTDs are the leading cause of neonatal and infant mortality and childhood disability. The objective was to develop risk groups for having children with NTDs among reproductive-age women based on the detection of endogenous and exogenous risk factors and to offer a differentiated approach to fetal NTD prevention.

METHODS: A retrospective analysis of risk factors in women who gave birth to children with NTD (175 women) and a control group (60 mothers of children without NTD, congenital malformations, or other chromosomal aberrations) and a prospective analysis of the folate cycle metabolic disorders and methylenetetrahydrofolate reductase gene polymorphisms C677T and A1298C were carried out.

RESULTS: The inclusion criteria for reproductive-age women in risk groups for fetal NTD should be regarded as the identification of ≥1 of the following risk factors: history of miscarriages or prenatal fetal death (odds ratio [OR] = 3.4); living in polluted areas and using well water for cooking (OR = 2.7); family history of strokes, heart attacks, varicose veins, thromboembolism, and thrombosis (OR = 3.04); family history of gastrointestinal tract or reproductive system cancer (OR 2.9); family history of congenital malformation (OR 3.9); congenital malformations in other children in the family (OR 4.36); and maternal age >35 years (OR = 2.1). When planning a pregnancy, women from the high-risk group are encouraged to identify levels of homocysteine and folic acid in the blood serum. Revealing hyperhomocystinemia alone or in combination with low folate levels in the blood before conception can be considered predictive of fetal NTD formation. The presence of hyperhomocystinemia is an indication for methylenetetrahydrofolate reductase polymorphism identification to determine preventive measures.

CONCLUSIONS: Forming risk groups for fetal NTD among reproductive-age women and detecting changes in folate metabolism will facilitate preventive measures by determining the timing and amounts of folic acid supplements and dietary recommendations.

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