Three decades ago South Carolina had twice the national average of neural tube defects (NTDs). The pioneering research of Dick Smithells in the 1980s and the confirmatory studies of the UK’s Medical Research Council and Andrew Czeizel in the early 1990s made it clear that enhanced folic acid intake prior to conception would lower the occurrence and recurrence rates of NTDs.

On the basis of these findings, South Carolina began a Neural Tube Defect Prevention Program in 1992, initially following the CDC’s recommendations for the use of folic acid supplementation and later by promoting the fortification of cereal grain flours with folic acid (see boxes below). These efforts resulted in a 60-70% reduction in these severe defects of the spine and brain.

The Prevention Program has recently conducted a survey of the types of neural tube defects that continue to occur in the present era of folic acid fortification. The majority (three-fourths), of NTDs continue to be isolated defects, presumably the type of defect most amenable to folic acid prevention.

This finding brings into question whether the dose of folic acid (400 mcg/day) is adequate to prevent all folic acid preventable NTDs. Although 4000mcg of folic acid was utilized in the Medical Research Council’s NTD recurrence study without reported adverse effects and is currently the Center of Disease Control and Prevention’s recommendation for recurrence, increasing the daily dose of folic acid for all women childbearing age must be weighed against potential side effects. On the other hand, some have suggested that the risk of side effects is overstated and that the concept of a tolerable upper intake level of folic acid should be abandoned. (Wald et al. Public Health Reviews 39:2, 2018)
Neural Tube Defects in South Carolina
1992-2019

Classes by type of NTD:
- Spina bifida: 18 (56%)
- Anencephaly: 9 (28%)
- Encephalocele: 5 (16%)

Detection method:
The majority of NTDs were detected by ultrasound during the early part of pregnancy.
- Ultrasound: 27
- Quad screen: 1
- Delivery: 4

Distribution of cases by geographic region:
- Region I (Piedmont): 12
- Region II (Midlands): 9
- Region III (Coastal): 11

NTDs in SC during 2019
(Project year 27)
Thirty-two cases of neural tube defects were identified in South Carolina in 2019

Spina bifida was more common than anencephaly accounting for 56% of cases.

SC Birth Defects Prevention Program staff will be happy to assist your office in any way to ensure that your patients have information regarding prevention of these serious defects. We also have patient literature available in Spanish. A dietary guideline with foods that are high in folic acid along with examples of menus using this information has proven to be a very helpful tool for Hispanic patients.

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The Greenwood Genetic Center (GGC) is a nonprofit institute organized to provide clinical genetic services and laboratory testing, to develop educational programs and materials, and to conduct research in the field of medical genetics. This newsletter is provided as an educational service to the health care community by GGC. For further information about the clinical and laboratory services available through the GGC please contact:

Clinical Services:
- 1-888-GGC-GENE (864) 941-8100 Greenwood
- (843) 588-4363 Charleston
- (803) 799-5390 Columbia
- (843) 664-2983 Florence
- (864) 250-7944 Greenville

Fetal Examination
- (864) 388-1700
- (864) 388-1707 (fax)

Laboratories
- 1-800-473-9411 Greenwood
- (864) 941-8110

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- Greenwood Genetic Center - Jane Dean, RN (Coordinator) (864) 941-8138, 1-800-676-6332
- Shriners Hospitals for Children (Greenville) - Myelodysplasia Services (864) 271-3444
- SC Department of Disabilities and Special Needs (803) 898-9789
- SC DHEC - SC Birth Defects Surveillance Program - Vinita Oberoi Leedom (803) 898-0771

Contributions to support the Birth Defects Prevention Program may be made through the Greenwood Genetic Center Foundation (www.ggc.org/foundation or 864-388-1813)