



Preliminary Report from the Pre-Fortification Study, Summer 2007

The *purpose* of this study is to determine levels of blood folate and vitamin B12 among relatives in families where a child has been born with a neural tube defect. To reduce the number of new cases of neural tube defects at birth, the Irish government plans to fortify flour with folic acid (that is, to add folic acid to flour). The study compares levels of blood folate and vitamin B12 before fortification with levels after fortification to ensure that the level goes up as expected. If relatives do not benefit from the government's programme (if their blood folate levels do not increase significantly), then we should consider other ways to prevent birth defects in this vulnerable group.

What we did. A total of 331 relatives attended one of several special sessions at the HSE Phlebotomy Clinic in Drogheda. Sessions were held on Saturdays and Tuesday evenings on eight different occasions between June and November, 2007, to allow as many to attend as possible. Blood samples were analyzed and we posted the results to each participant and to their GP.

The two final sessions in November were held to enroll nieces and nephews, siblings and offspring of the affected individual, who had not been included in the summer sessions. 26 relatives attended in November.

At present we are awaiting results from the dietary folate questionnaire. Participants completed a questionnaire that asked about a number of foods they ate recently, in order to establish the approximate amount of folate each person was getting in their diets. The questionnaire results are being analysed by a company in California that provided to the Boyne Research Institute a modified (for an Irish diet) version of their Dietary Folate Equivalent (DFE).

Preliminary Results. Of the relatives who gave a blood sample, a very small percentage, 1.9%, had blood folate levels below the normal range, and a somewhat larger percentage, 5.9%, had vitamin B12 results that were below normal.

What's next? The final phase is to complete the analysis and the genetic testing. The results will be prepared for publication and presentation at international meetings. Take a look at our website for further developments (www.boyneresearch.ie).

LAUNCH OF REPORT. Minister Mary Harney will be asked to launch a report from the results on a date in July to be announced. You will receive an invitation to the launch in Drogheda.



Summer Student Reception, 23 August, 2007. L-R, Sharon McGinty, Ciara Sheil, Mayor of Drogheda Anthony O'Donohoe, Christina Payne, Julianne Byrne. Congratulations to our 2007 Summer Students, Ciara and Christina, for achieving excellent results in their Leaving Certificate Examinations.



New Report Indicates that Maternal Uncles and Aunts have more Birth Defects

A new report indicates that certain groups of relatives are more likely to have birth defects. A recently published article from the Boyne Research Institute shows that maternal uncles and aunts in Irish families where an individual has been born with a neural tube defect (NTD), including spina bifida, are more than twice as likely to have a birth defect.

When the rate of birth defects in uncles and aunts related through the mother was compared to the rate of birth defects among uncles and aunts related through the father, maternal uncles and aunts had two and one half times more. These are serious, even life-threatening, birth defects, including NTDs, but also including congenital heart disease and syndactyly (or webbing of fingers or toes).

The information upon which this report was based was obtained by interview with nuclear families and with uncles and aunts in 78 families, mostly from the East Coast, but also from Northern Ireland. The interviews with 783 uncles and aunts were carried out done by BRI staff between 1995 and 2003.

The report is published in a US journal, *Birth Defects Research Part A*, in the January 2008 issue. Copies of the original article are available upon request.

As background, we should note that maternal uncles and aunts, as well as maternal first cousins have been shown to have more NTDs than paternal relatives in a number of different studies from Europe and North America. Our study shows an excess of all birth defects.

The implications are considerable: First, our work suggests that there are underlying, probably molecular, mechanisms that link the individual with the neural tube defect to distant relatives, second, that this link manifests itself in a number of different ways (different forms of birth defects). Finally, and perhaps most importantly, since we know that folic acid prevents NTDs, it may also prevent other forms of birth defects also.

So, even distant relatives in NTD families should be taking daily folic acid tablets. In addition, the wives of men who are maternal relatives really should be taking folic acid as recommended by the Irish government.

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Future Plans: Follow-up Study, Summer 2008

Background: Interviews with first cousins from BRI's study of Irish families with neural tube defects provides strong evidence for the continued presence of an influence along the maternal line, and for the effectiveness of supplemental folic acid in preventing birth defects. Further follow-up of relatives to collect information in recent pregnancies would help to confirm these results.

Objective: We plan to contact and interview eligible relatives during 2008, seeking information on their pregnancies (and pregnancies fathered) and the health of their offspring.

What we plan to do: Eligible relatives will be those who are in their reproductive years – women between the ages of 18 and 44, and men up to the age of 60. Interview will be by telephone. BRI's procedures to protect the anonymity and confidentiality of the data will be scrupulously observed.

What's next: BRI staff are preparing a proposal to submit to the BRI Ethics Board, seeking their approval on scientific and ethical grounds for the study. Once obtained, BRI staff will commence phone calls. This newsletter serves as an announcement to relatives that the study will take place this year.

Thank you for your continuing support and participation in this research and prevention partnership. We hope that eligible relatives will be happy to take part in the follow-up study.

Mission The Boyne Research Institute is a community-based research facility that conducts research for the community and in the community directed towards a better understanding of the origins and prevention of birth defects and the long term consequences of cancer during childhood.

Staff of the Boyne Research Institute Rebecca Scott, administrator/researcher; Sharon McGinty, research nurse and study manager; Julianne Byrne, epidemiologist is director of the Boyne Research Institute.