

NCU – Summative report for 2013

Report submission date: 01.03.14

Principal investigator: Jiong Li

Project title: *Medication during pregnancy and cancer risk in offspring: a cohort study in 2 million children in Denmark, Sweden, and Finland*

NCU grant received (€): 40 000

Project commencement and completion dates: 01.01.13 – 31.12.14

1. Briefly describe the project in a language understandable to non-scientists (max. 100 words)

Little is known about the aetiology of childhood cancer. Data from national registers in Nordic countries has been proved to be a valuable data resource for health research and it is even more important for research on childhood cancer, which has a very low incidence. Preliminary evidence has suggested that certain medications can increase cancer risk in offspring but the findings have been inconclusive. The proposed study utilizes high-quality combined data from Denmark, Sweden, and Finland, aiming to systematically assess the association between medication during pregnancy and cancer risk in childhood among 2 million people in the 3 countries.

2. Summarize the major findings of the project (max. 400 words)

Mothers of 38.6% of children in the study redeemed prescriptions for systemic antibiotics between three months prior to conception up to the child's birth ('exposed'). The OR of childhood cancer for exposure was 1.05 (95% CI: 0.91, 1.21) when adjusted for parity, maternal smoking during pregnancy, maternal age group and maternal education at time of birth. Point estimates were greatest for those exposed in the third trimester (OR=1.14) and for those exposed to doses in the highest tertile (OR=1.16), but these increases were not significant. When considering types of childhood cancer, most associations were not statistically significant; however statistical significance was reached for hepatic tumours among all exposed children (OR: 6.99; 95% CI: 1.16, 42.11), for exposure during the preconception period and hepatic tumours (OR: 24.77; 95% CI: 1.82, 337.21), and for leukemia in children whose mothers redeemed a total volume in the highest tertile (OR: 1.37; 95% CI: 1.01, 1.87) .

3. Describe how the project has increased our knowledge of the prevention, cause and/or cure for cancer (max. 150 words)

Results from this large cohort study, for the first time, suggest that there is no significant increase in childhood cancer among children exposed prenatally to systemic antibiotics. But research in this area should require large sample sizes, particularly to consider specific types of childhood cancer and the effect of timing and dosage of medication.

4. Outline how Nordic cooperation has added value to this project (max. 100 words)

Childhood care is rare and Nordic cooperation permits us to have large sample sizes, particular to consider types of childhood cancer and the effect of timing and dosage of medication during pregnancy.

For this project we have assembled a team in Denmark, the United States, Finland, and Sweden with extensive experience and expertise to conduct the proposed study. The collaborative team has been working efficiently to meet the challenges to collect the data from 21 national registers in the 3 countries.

We plan to investigate these further with the addition of data from the Californian Childhood Leukemia Study in USA. We are planning to submit new applications to NordForsk or EU, to examine programming effects of medications during pregnancy on future health in general, based on the findings from this study.

5. Publications resulting from the NCU research grant

- A. Momen N, Olsen J, Cnattingius S, Gissler M, Li J (2013). Early life bereavement and childhood cancer: a nationwide follow-up study in two countries. *BMJ OPEN*. May 28;3(5). pii: e002864. doi: 10.1136/bmjopen-2013-002864.
- B. Momen N, Olsen J, Cnattingius S, Gissler M, Li J (2013). Delivery by Caesarean section and childhood cancer: a nationwide follow- up study in three countries. *BJOG* , in press.
- C. NC Momen NC, J Olsen J, M Gissler M, Metayer C, H Kieler H, J Li J. Systemic antibiotics use duirng pregnancy and childhhod cancer in the offspring. In Manuscript.