Childhood leukaemia study points to smoking fathers

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"The results indicated that the risk of ALL, when compared with dad's who did not smoke during the year of conception, increased by 35% when fathers smoked more than 15 cigarettes a day around the time conception."—Dr Milne. Image: -Siby/flickr-

Research from Western Australia's Telethon Institute for Child Health Research finds that heavy smoking by fathers around the time of conception greatly increases the risk of the child developing Acute Lymphoblastic Leukaemia (ALL), the most common form of childhood cancer.

Published in the prestigious *American Journal of Epidemiology*, the study investigated the association between parental smoking and the occurrence of ALL in offspring.

“The first step towards the development of leukemia is thought to occur in utero in a lot of cases,” lead author Dr Elizabeth Milne says.

“So we look at prenatal exposures as it has to be something to do with what’s happening before the baby’s born.”

“Tobacco is a known carcinogen and, in terms of childhood leukemia, there’s a plausible biological pathway whereby paternal smoking could actually contribute to disease risk in the offspring,” she says.

In a comprehensive exposure questionnaire distributed nationwide to 388 families with cases of ALL and 868 control families, the group asked mothers and fathers to state where they lived, their occupation and how many cigarettes they smoked for every year of their life from the time they were 15.

“Using this information and knowing the year the child was born, we were then able to look at smoking levels around the time of conception,” Dr Milne says.

“The results indicated that the risk of ALL, when compared with dad’s who did not smoke during the year of conception, increased by 35% when fathers smoked more than 15 cigarettes a day around the time conception.”

The effect was only apparent amongst heavier smokers, with fathers who smoked less than 15 cigarettes, as well as former heavy smokers, not showing any increased risk.

Based on evidence from laboratory studies of sperm, the group believe that paternal smoking may cause adverse changes in sperm DNA structure that may then go on to effect the development of the baby.

“Oxidative damage to the DNA is the main type of damage seen as a result of smoking in sperm,” Dr Milne says.

Dr Milne cautions against implying blame, stating the cause of ALL is likely to be multifactor and that research efforts are about prevention in the future.

“The key message is that this is something that fathers and potential fathers should be informed of,” she says.

The group hope to further this research by looking at the paternal and offspring genotype in terms of DNA repair mechanisms to assess if there may be effect-modification by genotype.

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