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GSTM1 and *GSTT1* genetic susceptibility and interaction with chemical exposures in childhood acute lymphoblastic leukemia: A systematic review and meta-analysis

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Background: The glutathione s-transferase genes play an important role in the detoxification of carcinogenic substances and null mutations of these genes are linked to increase in acute Lymphoblastic Leukemia (ALL) due to an increase in susceptibility to environmental exposures of toxins and carcinogens and chemical exposures like tobacco smoke and pesticides are common carcinogenic substances that children could be vulnerable to as risk of developing childhood ALL.

Aim: The aim of this study is to analyze the effect of glutathione s-transferase mu1 (*GSTM1*) and theta1(*GSTT1*) genetic susceptibility and interaction of chemical pesticide and tobacco smoke exposures on childhood ALL.

Method: A total of 22 published case-controls were included in the meta-analysis of over 40,000 participants with 14,974 cases and 25,841 controls.

Result: Overall, the meta-analysis of these studies showed increase risk of ALL among children (random-effect, OR: 1.36, 95% CI: 1.18-1.57). Subgroup analysis showed that the *GSTM1* and *GSTT1* null genotype has association to childhood ALL (random-effect, OR: 1.36, 95% CI: 1.05-1.76) and chemical pesticide in comparison with tobacco smoke exposures did have an increased association with childhood ALL (random-effect, OR: 1.40, 95% CI: 1.10-1.78) and (random-effect OR 1.38, 95% CI 1.20-1.58), respectively.

Conclusion: In this study, the *GSTM1* null genotype is significantly associated with susceptibility to childhood acute Lymphoblastic Leukemia in Asians and chemical pesticides also showing increase associations. The *GSTM1* and *GSTT1* null genotypes show increase interaction with chemical pesticides in childhood ALL as compared to tobacco smoke exposures.

Biography

Samira B A Sesay is a Researcher in the Department of Epidemiology and Health Statistic, college of Public Health, Zhengzhou University with a passion for childhood health and improving health of susceptible populations like women, newborns etc. Prior to pursuing a MPH degree she grew interest and gained experience in evaluation, maternal and child health evidence-based research campaigns. With this interest, she did a comparative study on healthcare practices in community health facilities in her home country and her goal is to build innovative models for improving health care. Presently, she is working on a research in China to evaluate effect of environmental exposures in Henan on childhood leukemia incidence.

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