



Journal of Health Disparities Research and Practice
Volume 9, Special Edition 1, Summer 2016, pp. 92

© 2011 Center for Health Disparities Research

School of Community Health Sciences

University of Nevada, Las Vegas

Children's Susceptibility to Direct DNA Damage as Compared to That of Adults

Nicholas Bolanos

Marianne Berwick, Ph.D, M.P.H, University of New Mexico Division of Epidemiology,
Biostatistics and Preventive Medicine

Coordinating Center: Stanford University

ABSTRACT

DNA damage and genetic mutations have been strongly correlated with the risk of developing certain cancers such as melanoma. It is important to assess correlations in conjunction with findings that are related to DNA damage to order to have a greater understanding of how the disease operates. Direct DNA damage happens when UV photons directly penetrate a cell's DNA, causing base pairs to bond next to each other changing the sequence. Recent studies have begun to explore the idea that there are critical stages in one's life where DNA is more vulnerable to direct damage. Data collected from GEM, a database of over three thousand melanoma patients of varying age, ethnicity, occupation, etc., has given us a distinct insight as to when sunburns that cause DNA damage occur. The results have shown that an overwhelming majority of sunburns had occurred during the early stages of their lives. Using the data from GEM, one can infer that children have a higher susceptibility to this form of direct DNA damage; however, to analyze this phenomenon a holistic view of the environment, physiological, bio cellular, genetic and psychological distinctions between adults and children is needed to avoid oversimplification of this complex topic. Reviewing data from these areas formulates several hypotheses as to why children may be more susceptible to direct DNA damage for future studies. Although differences in DNA damage susceptibility between adults and adolescences have not been fully explored, using data from previously published work several observations, such as melanoma risk factors during childhood, can be made to rationalize these trends. Additional examination in this area could further explain the growing number of melanoma cases, as well as reassess the protocol and initiatives for prevention.

Key Words: susceptibility, melanoma, risk factors, direct DNA damage

ACKNOWLEDGEMENTS

The STEP-UP HS program is supported by the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health, Grant number: R25DK078382.