RISK FACTORS FOR MULTIPLE MYELOMA

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The incidence rates of myeloma show over a 10-fold difference around the world, with the highest rates reported among African Americans in the United States (U.S.) and the lowest rates reported among Asians. The causes of multiple myeloma and the reasons for the racial differences in incidence are unclear. The suggestive associations between the risk of multiple myeloma and exposure to ionizing radiation, solvents, and agricultural occupations, including those with exposure to pesticides and farm animals, have previously been reported. There are, however, few data concerning the specific pesticides that should be targeted for further investigations. Certain prior medical conditions and treatments have been suspected to increase the risk of myeloma through either chronic immune stimulation or another biological mechanism. There has been some suggestion of increased risk of myeloma with autoimmune diseases. Some studies suggest that certain lifestyle and genetic factors, particularly low socioeconomic status (SES), obesity, and familial aggregation, may also be linked to risk of myeloma. Exposure to cigarette smoking and alcohol use do not appear to be related to risk, and studies for personal use of hair dyes remain inconclusive.

Low socioeconomic status has been shown to partially account for the higher incidence of multiple myeloma among U.S. blacks. Low social class may be a surrogate for a set of negative environmental characteristics, such as poor housing, dangerous jobs that may result in differential exposure to carcinogens, unemployment, limited access to medical care, stressful home or work environments, poor nutrition, or exposure to infectious agents. However, the SES-related exposures that may contribute to multiple myeloma risk remain to be determined.

The recently suggested association between obesity and myeloma, perhaps through a mechanism that promotes growth, survival and migration of malignant plasma cells is biologically plausible. Cytokine interleukin-6 (IL-6) has a substantial role in the initial progression of myeloma cells and promotes myeloma cell survival through the regulation and expression of anti-apoptotic proteins. Obese individuals have higher levels of IL-6, which may in part be linked to the higher levels of the adipokine leptin. Insulin-like growth factor-I (IGF-I) is another important survival and proliferation factor for myeloma cells, which is closely linked to obesity and metabolic syndrome.

From the research completed to date, it appears that myeloma may have a substantial environmental etiologic component. This component, however, is not completely understood. Evidence is now emerging from the literature of complex interactions between genes and environment in the pathogenesis of cancer. The future challenge is to determine which environmental agents and genetic factors influence myeloma risk, both as independent risk factors and as modifiers of one another.
References


