



Commentary

Uncovering the mechanisms underlying the social patterning of diabetes

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Extensive evidence shows that social and/or economic disadvantage is associated with a range of poor health outcomes. Unlike differences in health that are related to biological factors (e.g. genetics, age or gender), health disparities refer to differences in health that are linked to one's position in the social/economic hierarchy. Health disparities are differences that could be prevented by appropriate social policies [1]. The mechanisms by which social position leads to disease are still largely unknown.

Two explanations have been proposed for how social/economic position might lead to different health outcomes: differential exposure and differential vulnerability [2]. The differential exposure explanation is that social variation in disease risk is due to variation in exposure to risk factors. Socially disadvantaged individuals may have higher rates of disease because they have greater exposure to risk factors for the disease. This explanation for health disparities assumes that the relationship between risk factors and health outcomes is the same across social groups. Alternatively, it may be that social position confers differential vulnerability to the same risk factors, such that exposure to the same risk factor may result in different levels of disease risk in different social groups. Distinguishing between these two possible explanations for health disparities is not merely of theoretical interest. It has important implications for interventions. If social position confers differential vulnerability to particular risk factors, then interventions that eliminate disparities in risk factors will not necessarily eliminate disparities in health outcomes.

Diabetes is a complex health condition that dramatically increases risk of cardiovascular disease, kidney disease and a host of vascular problems, and it is highly influenced by social/economic position. Risk of diabetes is higher in socially disadvantaged groups [3,4]. Data presented by Vinke, et al. [5] in this article of *EClinicalMedicine* are informative with regard to the mechanism by which social position might impact diabetes risk. The differential exposure explanation is that socially disadvantaged groups have greater risk of diabetes because

they are more likely to eat poor quality diets, an important risk factor for diabetes. If that explanation were true, then eliminating the difference in diet quality between social groups should result in elimination of the social disparity in diabetes. The differential exposure explanation assumes that the relationship between diet quality and diabetes incidence is constant across socioeconomic groups.

Vinke et al., using prospective data from the Dutch Lifelines Cohort, a large population-based cohort in The Netherlands, found that the data did not support the hypothesis that socioeconomic disparities in diabetes are caused by differential exposure to poor diet. Consistent with other studies, the authors found a strong main effect of diet quality on incidence of diabetes. They also found an interaction with education in which the influence of diet quality on diabetes incidence was highly attenuated in the low education group relative to the higher education groups. That is, a high-quality diet was much less protective for those in the lowest tertile of educational attainment than for those in the highest tertile. Among individuals with a high-quality diet, those in the lowest education group had two times the incidence of diabetes as those in the highest education group. This finding is consistent with what has been called the differential vulnerability explanation for social patterning of diabetes, but in this case the more educated group is more vulnerable to the effect of the risk factor (poor diet). The less educated group appears to be more vulnerable to diabetes overall. Even when they eat a high-quality diet, their risk of diabetes remains high.

The Vinke et al. study suggests that diabetes is causally overdetermined among individuals in the lowest education group. Individuals at lower levels of the social hierarchy may be exposed to a greater number of risk factors for diabetes; in the absence of poor diet, they remain exposed to other risk factors that are sufficient to cause diabetes. Importantly, this implies that a population-wide diet intervention which achieved equally high diet quality across levels of the social hierarchy may exacerbate health disparities in diabetes because it would eliminate more cases of diabetes in higher social groups than lower social groups.

This paper serves as another reminder that interventions to reduce health disparities require us to address their root causes, which lie far outside the purview of medicine. Medical and behavior change interventions (such as changing dietary behavior) may have less impact for individuals at the bottom of the social hierarchy, who must cope with the structural violence of class oppression, racial discrimination and economic injustice. These upstream factors are extremely biologically threatening. Research like that of Vinke et al. serves the cause of health equity by helping to elucidate the

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mechanisms by which social and economic conditions breed disease. Hopefully better understanding of these mechanisms will enable scant resources to be spent in the most impactful way as we strive to achieve more equitable societies.

Author's contribution

EBL wrote this commentary.

Declaration of competing interest

The author has nothing to declare.

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