



The Impact of Prenatal and Early Postnatal Nutrition on Child Development: Comments on Lumey and Susser, Innis and Atkinson

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Topic

Nutrition and pregnancy

Long-Term Effects of Prenatal and Early Postnatal Nutrition on Adult Psychosocial Outcomes. Comments on the article by Lumey and Susser

Introduction

The Lumey and Susser article discusses the research on the long-term impacts of prenatal and postnatal nutrition with a focus on the psychosocial and behavioural consequences in adulthood. This is an important health and well-being issue for the general population. Inadequate nutrition in the first months of life, during pregnancy or shortly after birth, can affect the development of the brain in ways that leave traces into adulthood.¹ The research on social inequalities and population health shows how significant early-life circumstances are in the long term.^{2,3} This research is important because it identifies the factors that cause health and well-being problems so that we can intervene as early as possible to prevent these problems from arising.

Research and conclusions

The authors' interpretations are based on the literature they present. The subject has not been studied extensively, and the comparability of the findings is problematic. It is always risky to attempt to draw conclusions when mixing the findings of studies on individuals who have experienced famine, studies in developing countries where malnutrition is rampant and more recent studies on poor families in developed countries. I therefore agree that it would be important to plan studies that control for the variables which may be at play in these relationships. I do not agree that the studies done to date suggest that poor nutrition or growth are not likely to be involved in the relationship under investigation. For example, clinical studies on anaemia show that anaemic children have trouble concentrating at school and tend to be hyperactive.^{4,5,6} Similarly, we must not overlook the effects of stress in poor families, where food is scarce.⁷

Implications for policies and services

I agree with the conclusions the authors draw. Children living in precarious conditions which may negatively affect the nutrition of their mothers during the prenatal period, and their own nutrition postnatally, also have other needs - physical, emotional, and

psychological. Merely giving nutritional supplements to the children without regard for the other deficits in the family environment would be ethically unacceptable. We know, for instance, that poor families that lack food experience highly stressful situations which may limit the ability of the parents to respond to the many other stimulation needs of their children. Support programs that target poor pregnant women need to address not only their physical and nutritional needs, but the issues of low self-esteem, lack of autonomy and stress that are a day-to-day reality for people who have to beg for food or who live in fear of having nothing to eat.⁸ At the same time, children who are adequately stimulated but inadequately nourished also experience certain deficits which affect their nutritional status in addition to the effects of hunger and food deprivation. Neglected children who are fed irregularly adapt by ignoring the physiological signals of hunger and satiation, and end up, in the long run, developing eating disorders. Clearly, nutritional supplementation for needy families must be accompanied by psychosocial and economic support, and vice versa.

*Nutrition and Its Impact on Psychosocial Child Development: Preterm Infants.
Comments on the article by Innis*

Introduction

The author deals with the relationship between nutrition and child development in preterm children. This is an important matter because preterm children exhibit both eating problems and growth profiles that are different from other babies. To counter growth deficiencies that can have more or less permanent sequela for these children, we need to understand the role played by nutrition. The proportion of premature infants who survive is steadily increasing thanks to technological and medical advances in infant care. It is imperative that we find better ways of dealing with the problems that will be faced by the increasing number of surviving premature or underweight infants.

Research and conclusions

The author's interpretations refer primarily to the physiological aspect of child development as it relates to nutrition. The studies mentioned do not put the other confounding aspects of nutrition, premature birth and low birth weight into perspective. For example, other factors such as maternal smoking during pregnancy, which is positively and progressively associated with poverty, may play a role in cognitive development deficiencies and even growth deficiencies.⁹⁻¹² In underprivileged environments, where food is scarce and of poor quality, the lack of food may also contribute to the fact that the children fail to catch up to full-term children by school age. Also, in a given population, children who are underweight at birth tend to gain more weight in their first year, compared to children who weigh more at birth.^{13,14} This weight "recovery" whereby children who are underweight at birth end up weighing more than other children at one year of age is inconsistent with the findings presented by the author.

Implications for policies and services

The author does not provide enough support for his/her implications. He/she only considers the economic aspect, i.e., the intervention costs for these children. There are individual and social implications that should have been mentioned. For example, children who suffer from cognitive deficits will be less likely to succeed in school and to

reach as high a social position in adulthood, with foreseeable health implications, since social position is positively and progressively associated with health status and life expectancy.² There are also ethical questions that need to be asked in this type of approach. Since it goes without saying that parents who are expecting a child will want everything to be done to keep their child alive if he or she is born prematurely, we must come to grips with the broader implications of using technologies that make it possible for children who will experience a variety of problems to survive regardless of the cost.

Nutrition and Its Impact on Psychosocial Child Development: Perspective on Preterm Infants. Comments on the article by Atkinson

Introduction

This article examines the relationship between nutrition in the first months of life and child development. Certain studies have indeed observed a relationship between breastfeeding and subsequent development in children. It is not clear whether or not the constituents of breast milk make a difference in and of themselves (as essential to development), or if the difference comes from other non-nutritional characteristics associated with breastfeeding. This discussion is important for the promotion of breastfeeding and the development of better quality products (infant formulas) for children who are not breastfed.

Research and conclusions

I agree with the author's interpretations. Breast milk does contain substances that can play a role in the development of preterm children, and we need to continue advocating breastfeeding as a maternal behaviour that has other benefits as well. However, the findings of the studies are contradictory, because they are based on different research protocols that fail to give a continuous picture. We need a better description of the relationship between breast milk and the development of preterm children based on more standardized study designs that isolate the effect of breast milk from the related psychosocial and socio-economic aspects.

Implications for policies and services

The policy implications described by the author present a broad perspective that encompasses the long-term health and well-being of children. The implications for the development of nutrition policies and programs are also important. For example, the recommendations on breastfeeding are important for children who are born prematurely or with a low birth weight. If it is important to develop products to make up for deficiencies in preterm children, it is just as essential that we work to prevent children from being born prematurely and/or with a low birth weight in the population, especially given that these births continue to be more frequent in socio-economically disadvantaged families where less importance is attached to breastfeeding.¹³

REFERENCES

1. Barker DJP. Fetal origins of coronary heart disease. *British Medical Journal* 1995;311(6998):171-174.
2. Evans RG, Barer ML, Marmor TR, eds. *Why are some people healthy and others not? The determinants of health of populations*. New York, NY: Aldine De Gruyter; 1994.
3. Keating DP, Hertzman C, eds. *Developmental Health and the Wealth of Nations. Social, biological, and educational dynamics*. New York/London: The Guilford Press; 1999.
4. Johnson SR, Winkleby MA, Boyce WT, McLaughlin R, Broaswin R, Goldman L. The association between hemoglobin and behavior problems in a sample of low-income Hispanic preschool children. *Journal of Development and Behavioral Pediatrics* 1992;13(3):209-214.
5. Liu J, Raine A, Venables PH, Dalais C, Mednick SA. Malnutrition at age 3 and lower cognitive ability at age 11 years: independence from psychosocial adversity. *Archives of Pediatrics and Adolescent Medicine* 2003;157(6):593-600.
6. Sungthong R, Mo-suwan L, Chongsuvivatwong V. Effects of haemoglobin and serum ferritin on cognitive function in school children. *Asia Pacific Journal of Clinical Nutrition* 2002;11(2):117-122.
7. Dubois L, Bédard B, Girard G, Bertrand L, Hamelin AM. Alimentation: perceptions, pratiques et insécurité alimentaire. Dans : *Enquête sociale et de santé 1998*. Québec, Québec: Institut de la statistique du Québec; 2000.
8. Rouffignat J, Dubois L, Panet-Raymond J, Lamontagne P, Cameron S, Girard M. *De la sécurité alimentaire au développement social. Les effets des pratiques alternatives dans les régions du Québec. 1999-2000*. Québec, Québec: CQRS et Ministère de la Santé et des services sociaux; 2001.
9. England LJ, Kendrick JS, Gargiullo PM, Zahniser SC, Hannon WH. Measures of maternal tobacco exposure and infant birth weight at term. *American Journal of Epidemiology* 2001;153(10):954-960.
10. Richards M, Hardy R, Kuh D, Wadsworth EJ. Birth weight and cognitive function in the British 1946 birth cohort: longitudinal population based study. *British Medical Journal* 2001;322(7280):199-203.
11. Rondo PHC, Ferreira RF, Nogueira F, Ribeiro MCN, Lobert H, Artes R. Maternal psychological stress and distress as predictors of low birth weight, prematurity and intrauterine growth retardation. *European Journal of Clinical Nutrition* 2003;57(2):266-272.
12. Spencer N. Social, economic, and political determinants of child health. *Pediatrics* 2003;112(3):704-706.
13. Dubois L, Bédard B, Girard M, Beauchesne É. *L'alimentation. Étude longitudinale du développement des enfants du Québec (ÉLDEQ 1998-2002). Les nourrissons de 5 mois*. Québec, Québec: Institut de la statistique du Québec; 2000.
14. Ong KKL, Ahmed ML, Emmett P, Preece MA, Dunger DB. Association between postnatal catch-up growth and obesity in childhood: prospective cohort study. *British Medical Journal* 2000;320(7240):967-971.

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