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VITAMIN D AND METABOLIC SYNDROME: HOW MIGHT VARYING STATUS AFFECT RISKS OF ITS COMPONENT DISORDERS, AND AT WHAT STAGE OF RISK DEVELOPMENT?

Statement of the Problem: Metabolic Syndrome [MetS] and its complications [e.g. T2DM, CVD, NAFDL] are increasingly common at all ages, associated with obesity, and poor life-styles, (both reducing serum 25(OH)D concentrations; vitamin D status). MetS disorders associate inversely with serum 25(OH)D, from childhood, cross-sectionally and prospectively. Known effects of vitamin D capable of reducing MetS risks include effects on adipose tissues, hepatic fat synthesis, lipid profiles, cardiac risk factors, inflammation, insulin secretion and resistance, and hepatic glucose release, but evidence of causality for lack of vitamin D is sparse. However, RCT designs are often inappropriate for nutrients in failing to study correction of deficiency or inadequacy; they may be too short to affect slowly evolving tissue damage, or start after tissue damage is established. Some better designed RCTs have shown MetS disorder improvements.

Methodology & Theoretical Orientation: Discussion of MetS variables for which vitamin D has potentially protective effects is based on peer reviewed literature [e.g. in PubMed in the last >50 years], and includes my own work.

Findings: Beneficial effects of vitamin D on MetS disorders with known mechanisms include: reducing hepatic synthesis of fat and hepatic glucose release, promoting insulin secretion, reducing beta cell damage in hyperglycaemia, suppression of inflammation and tissue-destructive MMP secretion: importantly in early life, they include inhibition of adverse epigenetic changes, and prevention of irreversible adipocyte proliferation.

Conclusion & Significance: Maintaining long-term vitamin D repletion from a young enough age to be likely to be able to prevent, slow down or even correct, early MetS pathogenesis, may prove to be a public health bonus if vitamin D inadequacy is eliminated at the population level, as in Finland by food fortification.

Biography

Barbara J Boucher worked as a joint NHS and academic physician at the London Hospital, (later Barts & The London) and it's medical school, remaining research active after clinical retirement when she was made an honorary professor. Her main clinical activities were in acute internal medicine, diabetes care, and teaching, with research carried out on a wide range of clinical metabolic problems, but focused especially on developing systems of diabetes care, the investigation of metabolic disorders, especially in diabetes, and working on vitamin D insufficiency and 'betel-chewing' as potential aetiological factors relevant to the onset of both metabolic syndrome and type 2 diabetes, and she continues to produce peer reviewed publications.

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