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THE KYNURENINE PATHWAY: A POSSIBLE LINK BETWEEN THE DEPRESSION AND ANXIETY SPECTRUM, METABOLIC SYNDROME AND EATING DISORDERS

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Introduction – Eating Disorders (ED), including obesity, with and without Metabolic Syndrome (MetS), are associated with anxiety and depression. Increased levels of cytokines and their consequences on the pathway of kynurenine (KYN), the main metabolite of tryptophan, have been proposed to account for these associations.

Aim – To review the evidences suggesting biochemical connections between the Depression and Anxiety Spectrum (DAS), MetS and ED, respectively, focusing on the role of the KYN pathway.

Methods – Three PubMed searches of the literature conducted in October 2013 (key words: 'kynurenine' 'eating disorders'; 'kynurenine' 'waist circumference'; 'kynurenine' 'obesity' 'metabolic syndrome') provided 2, 3 and 7 references, respectively.

Results – The metabolism of L-tryptophan through the KYN pathway depends on the following three factors: 1) NUTRITION; in underweight ED L-KYN metabolites (quinolinic acid, kynurenic acid, 5-hydroxyindoleacetic acid) are significantly reduced until the restoration of normal body weight. In overweight and obesity with and without MetS, increased KYN levels and KYN/tryptophan ratio are found, with abdominal fat content as strongest factor for an increase of the KYN/TRP ratio. 2) AGE; KYN/TRP ratios are markedly increased vs. decreased in overweight and obese adults vs. juveniles, respectively. 3) INFLAMMATION; IFN-gamma induces the indoleamine 2,3- dioxygenase (IDO)-catalyzed synthesis of KYN, whose derivatives increase in diabetes (xanturenic acid), psychosis (kynurenic acid), and depression (quinolinic acid).

Conclusions – The KYN pathway may link DAS, MetS and ED explaining the frequent association of DAS to so many different disorders. Further studies are needed in order to understand these complex connections.

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