

The Role of Essential Fatty Acids On the Neurochemistry of the Brain

Three singularly individual words, combined together have a profound effect on our wellbeing and ability to function as a human being. Considering each word in isolation, "fat" has acquired an unfortunate connotation that belies its importance in the neurochemistry and biochemistry of the human body.

We have become accustomed to consider fat as an unwelcome addition to our physical makeup, due to its ability to become stored in both our hips, and waistline, whereas we have not been sufficiently informed enough to recognise that, fat stored inside the protective packaging of the skull, is an essential component of our brain.

So now we have considered the second word of our triad, "essential"
The third word "acid" when combined with the word fatty becomes the scientific term Fatty Acid that describes the molecule that can exist in both water and oil. Combine two molecules of Fatty Acid together and we have the major structural component of the skin of cells, the lipid membrane. The lipid membrane is the packaging of our brain cells, neurons, which are used as the information stores and carriers necessary for all functions of our brain. Combine three fatty acid molecules, and you create a substance, which can be stored for future use. Essential fatty acids EFA's are used to manufacture hormones and are the foundations of prostaglandins, which become the wiring circuitry of every cell in the brain.

We have at our disposal two families of EFA's; Omega 3 and Omega 6. Omega 3 EFA is found in fish oils, and Omega 6 are contained in primrose oil, sesame oil, safflower, corn and sunflower oils. EFA's are fats that are essential, we must have and yet we cannot make.

The question of why we must have EFA's as part of our nutrient intake has been answered previously, to participate in the formation of cellular structure of our brain, and aid the formation of prostaglandins. The second reason and by no means less important is the role played by lipids in the metabolism and neurochemistry of the Central Nervous System. The CNS which has been compromised by an incident in pregnancy and birth, resulting in the manifestation of the conditions on the autistic syndrome disorder scale.

It appears that there is a biological electron transfer defect in autistic disorders. In simple language autism stretches out and affects the whole body not just the brain. Children with autism have immune, gastrointestinal, hormonal, hepatic, and nervous system deficits. They have difficulty detoxifying their own bodies, due to problems with their sulphur metabolism. This is why they have things like food sensitivities, digestive difficulties, toxicity, infectious manifestations, sensory abnormalities and cerebral blood flow.

By balancing the body at its most elemental level, the electrolytes, (the importance of which is discussed in article Neurology of a Problem). Building upon them in respect to interact with the bi-lipid (bi refers to two, lipid refers to

fatty acid) cell membrane, we can safely correct the “biological electron transfer defect”. Simply put, the effective transfer of information between brain cells is paramount on the exact composition of the electrolyte, or the electron carrying mechanism, and the effectiveness of the cell membrane to allow the information to pass to the next cell.

The effective passage of information, not only between cells in a particular part of the brain, but between the differing parts of our brain comprising the CNS, is essential for the effective working of the brain. The uninterrupted passage of information received by our sensory gathering systems, to the information processing parts of the brain, onto the command and control areas, then transformed into meaningful output, is the essence of our learning and development process.

In her publication, “The Neurochemistry and Neurophysics of Autistic Spectrum Disorders”, Dr Patricia Kane observes “an enormous body of evidence, that essential fatty acids (4 to 1 ratio of omega 6 to omega 3) play a vital role in the brain, cell to cell interactions, genetic expression, and appear to be the focal point of man’s evolution. Understanding lipid and EFA metabolism is crucial for maintaining both physical and mental health. Newly documented research on targeted lipid manipulation has shown that dietary changes can dramatically influence the body human and most profoundly the brain.”

Dr Kane goes on to conclude “Viewing the brain of the child with ASD as a biological orchestration as it relates and interacts with membrane lipids, offers, a new dimension into understanding the specificity of disturbances in the brain in regard to lipid/peptide interactions on a cellular level, and the intricate integration of essential fatty acids and prostaglandins. The CNS cannot be controlled without respect to lipid substrate, yet fatty acid metabolism has been poorly delineated and often simply ignored in treatment protocols.”

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