Essential Brain Nutrients
Breastfeeding for Optimum Development

By James W. Prescott, Ph.D.

The crucial role of breastmilk with its immunological agents for protecting the newborn/infant against disease and illness is well known, as is its essential role in promoting the development of the infant's own immune system. What is less well known is that the infant's immune system does not reach maturity until about 5-6 years of age. This developmental immaturity of the infant's immune system can serve as a guide to appreciating the developmental immaturity of the infant's brain with its various structural, neurochemical and electrophysiological processes that extend in development well beyond the 5-6 years of maturity for the immune system.

It is also well known that sensory stimulation is like a nutrient and is essential for the normal growth, development and functioning of the brain. Substantial research spanning more than twenty-five years clearly demonstrates that sensory deprivation during the formative periods of brain development induces brain abnormalities of both structure and function (neurochemical and neuroelectrical activity). These sensory deprivation processes which involve the emotional senses of body touch, movement and smell have been well described in failed affectional bonding in the mother-infant/child relationship which results in infant, child and adult patterns of depression, impulse dyscontrol, violence and substance abuse.

One of the brain neurochemical transmitter substances—serotonin—has been shown to be significantly reduced under conditions of failed mother-infant affectional bonding. Other studies involving adult depressed and violent persons and criminals have clearly documented deficits of brain serotonin in these persons who have a history of suicidal and assaultive/homicidal behaviors. Unfortunately, these studies have not evaluated the extent of failed maternal-infant/child bonding in these depressed and violent adults and it has been assumed that the brain serotonin deficits found in thesesubjects was due to some genetic factor rather than to maternal-infant environmental factors.

This error of interpretation is compounded by the failure to realize that there is another neurobiological mechanism involved in the development of brain serotonin—tryptophan—a precursor amino acid essential for the development of brain serotonin which is richly present in colostrum and breastmilk but absent in formula milk. Thus, two distinct and different neurophysiological mechanisms have been identified that contributes to deficits in brain serotonin: a) failed physical affectional bonding in the maternal-infant/child relationship (sensory processes); and b) the amino acid tryptophan present in colostrum and breast milk but absent in formula milk (neurochemical processes).

Millions of years of mammalian evolutionary biology have naturally joined these two different psychophysiological processes in the act of breastfeeding where they are clearly mutually reinforcing for one another.

Only in the human mammal do we find the newborn separated from its mother at birth and the mother not breastfeeding its newborn and infant. We have discovered that such aberrant behaviors which violate millions of years of evolutionary biology and psychobiology have exacted a terrible price upon the physical, emotional and social health of the newborn and infant and as a child, adolescent and adult—depression, impulse dyscontrol, violence and substance abuse.

There are, of course, other neurochemical processes of the brain that are involved in affiliative bonding and sexual behaviors, e.g. oxytocin which has traditionally been known for its effects on uterine contraction and milk ejection. Oxytocin (OT), however, has other powerful effects, e.g. studies have shown that brain OT can selectively decrease the rat pup's separation response from its mother and modulate social and sexual behaviors in male squirrel monkeys which were related to the social dominance status of the monkey and to levels of gonadal steroids which influence oxytocin receptor density.

Other animal studies have shown that direct injection of OT into the brain produced an immediate inhibition of sexual activity in sexually active prairie voles, thus demonstrating the role of oxytocin in sexually affiliative and satiety behaviors.

Studies in human subjects have shown direct relationships between blood OT levels, sexual orgasm and the degree of sexual pleasure experienced, as reported by multi-orgasmic woman participating in these studies. Other studies in male subjects have shown as much as a 362% increase of blood OT from baseline to orgasm and that naloxone blocked this effect. Additionally, naloxone (a blocker of endorphin/morphine effects, i.e. pleasure) was found to significantly reduce sexual arousal and pleasure.

The above findings suggest, among other predictions, that adults who have been breastfed for "two years and beyond" will have enhanced integrative brain development for the experiencing of sexual affection, pleasure and bonding which would translate into more stable psychosexual and marital relationships, e.g. diminished divorce rates .

The above findings, taken collectively, support an evolutionary biological and psychobiological perspective that breastfeeding is essential for normal brain development, particularly, those brain processes associated with depression and violence and their opposites of pleasure, affiliative social and sexual behaviors; and peaceful-harmonious behaviors.

There are many other neurobiological properties of breastmilk that are important for normal brain development and behavior which are not found in formula milk but cannot be reviewed herein, e.g. long-chain polyunsaturated fatty acids (LCPs) which have been linked to enhanced intellective-cognitive functioning in breast-fed vs formula-fed infants.

The increasing emphasis in industrialized societies to place infants and children in institutionalized day care assures the lack of affectional bonding between mother and infant/child with all of it's consequences.

For all of the above reasons (and others), it has been my challenge to the criminal justice system to find one murderer, rapist or drug addict in any correctional facility in America who has been breastfed for "two years and beyond", as recommended by the World Health Organization.

A proposed study of adults who have been breastfed for "two years and beyond", would provide a strong data base to support the above stated relationships and to call for a national health policy that would support mothers being nurturant which would include breastfeeding . If such a national health policy were to be implemented, it would move our culture away from violence and much closer to one of peace.

The lessons to be learned are clear. If human beings are to survive as a species, he/she must return to the "life plan" nature intended, who through her wisdom of millions of years of evolutionary biology and psychobiology, has provided for the intimate physical affectional bonding between mother and her offspring which establishes the foundation for later sexual affectional bonding and for human love itself.

For without human love there can be no survival of Homo Sapiens.

With this in mind the words of Aristotle, (Politica c. 350 B.C.) are particularly relevant.

> As the body is prior in order of generation to the soul, so the irrational is prior to the rational. The proof is that anger and wishing and desire are implanted in children from their very birth, but reason and understanding are developed as they grow older. Wherefore, the care of the body ought to precede that of the soul, and the training of the appetitive part should follow; none the less our care of it must be for the sake of the reason, and our care of the body for the sake of the soul.
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