Getting to the root of infertility

NOTE: Studies confirming that the free glutamate in MSG caused brain damage, intractable obesity, infertility and more were done before it was understood that excitotoxic free glutamate would be found in ingredients other than MSG.

Abstract

Submissions to medical journals traditionally offer cutting edge research that throws new light on a subject of interest, either presenting a solution or encouraging/stimulating meaningful research for the future.

In contrast, this submission draws from a number of seemingly unrelated subjects as Albert Einstein suggested in what he called Combinatory Play: taking two or more unrelated things and putting them together to generate new ideas. Einstein did not invent the concepts of energy, mass, or speed of light for the equation, $E=mc^2$. Rather, he combined these concepts in a novel way which restructured the way he looked at the universe.

Drawing from what is known about glutamate-induced brain damage, nourishment of fetuses and neonates by pregnant and lactating women, and the availability of free glutamate in processed foods, snacks, dietary supplements, pharmaceuticals and more for uptake by the human body, we propose to establish that ingestion of free glutamate by humans 1) can cause infertility following brain damage to the arcuate nucleus of the hypothalamus (AN), and 2) that ingestion of free glutamate by humans lies at the root of the fertility crisis.

Introduction

In the 1970s it was demonstrated by Olney and others that reproductive dysfunction follows glutamate-induced brain lesions in the arcuate nucleus of the hypothalamus (AN), and that monosodium glutamate fed to laboratory animals was an excellent source of free glutamate.

It is the purpose of this paper to establish that ingestion of free glutamate by humans 1) can cause infertility following brain damage to the AN, and 2) that ingestion of free glutamate by humans lies at the root of the infertility crisis.

This is what we know:

1. Three conditions must be met in order to produce food-induced neurotoxicity:

- There must be a vulnerable brain (immature or damaged)

- There must be a sufficient quantity of excitotoxic free glutamate to enable that free glutamate to become excitotoxic.

  (Glutamate is an excitotoxic amino acid. When present in controlled quantities it is essential to normal body function. When accumulated in excess, in amounts more than needed for normal body function, glutamate neurotransmitters fire non-stop until the brain cells targeted by those neurotransmitters die) (1-6).

- There must be a way for that excess of glutamate to be delivered to the vulnerable brain.

2. Glutamic acid (free glutamate) fed to infant animals causes brain lesions in the arcuate nucleus of the hypothalamus (7-16).

3. Today there is sufficient excitotoxic free glutamate in processed foods, dietary supplements, snacks, protein powders and protein drinks, protein substitutes, enteral care products, and pharmaceuticals for a person to consume the quantity necessary for that free glutamate to become excitotoxic.

In 1957, bacterial fermentation was introduced as a new and improved method for production of free glutamic acid for use in food. From that point forward, the genetically modified bacteria used to secrete free

glutamic acid through their cell walls guaranteed virtually unlimited production of free glutamic acid (17).

It wasn't long before competing manufacturers added dozens more excitotoxic food additives to the American diet. Following MSG's surge in production and its manufacturer's aggressive advertising, there was broad recognition that profits could be significantly increased if a company produced its own flavor-enhancing additives. Since that time, the market has been flooded with flavor enhancers and protein substitutes that contain manufactured free glutamate (MfG) such as hydrolyzed pea protein, yeast extracts, maltodextrin and soy protein isolate, as well as MSG. To that has been added the toxic load contributed by excitotoxic aspartic acid, approved by the FDA for use in aspartame, equal, and related products starting in 1974

Since the 1957 change in method of MSG production, there are so many products that contain excitotoxic ingredients that it is easy for a consumer to ingest an excess of excitotoxic material during the course of a day (18- 23). Thus, a pregnant woman could easily become a vehicle for delivering brain-damaging free glutamate to her fetus and neonate.

4. Effective delivery of excitotoxic free glutamate would depend in large part on the integrity/health of the brain to which it is being delivered.

In children and adults, delivery of free glutamate to a vulnerable brain can be achieved simply through the subject's consuming a sufficient quantity of free glutamate to cause the free glutamate to be excitotoxic.

Delivery of excitotoxic free glutamate to the vulnerable brain of a fetus and/or neonate will be achieved when a pregnant or lactating female passes excess free glutamate to a fetus or neonate through the placenta or in mothers' milk.

Once it is understood that excitotoxins are readily available, it is easy to grasp how these toxins are transported to the fetus and newborn where they cause brain damage which in turn causes infertility.

Nourishment (and not so nourishing material) is delivered to the fetus in the form of material ingested by a pregnant woman and passed to the fetus through the placenta.

MSG can cross the placenta during pregnancy (24-26), can cross the blood brain barrier (BBB) in an unregulated manner during development (27), and can pass through the five circumventricular organs which are leaky at best at any stage of life (28-29).

Glutamate is an ingredient that passes to the fetus. The placenta does not filter out glutamate (24). Moreover, the BBB is easily damaged by fever, stroke, trauma to the head, seizures, ingestion of MSG, and the normal process of aging (30-31). And the fetus will be more vulnerable to glutamate-insult than the newborn.

Similar to drugs and alcohol, free glutamate can also be passed to infants through mothers' milk. Newborn humans will receive glutamate through mothers' milk or through infant formula, both of which routinely contain free glutamate (32).

The glutamate in mothers' milk, however, will not be excitotoxic unless lactating mothers ingest excessive quantities of free glutamate – quantities sufficient to cause free glutamate to become excitotoxic.

Discussion

With the first suggestion that MSG might have toxic potential, those with financial interest in promoting MSG as a valuable flavor-enhancer launched a well-funded, well-articulated campaign to promote their product, and deny any hint of toxicity. That included rigging studies to come to the foredrawn conclusion that MSG is a harmless food additive and securing the active cooperation of regulators as well as the help of

medical professionals, many of whom appeared to be more than happy to look the other way. (33).

That might account for the fact that to date, the role of MSG and MfG in the fertility crisis has been overlooked.

Conclusion

Reproductive dysfunction can be caused by excitotoxic amino acids ingested by pregnant and nursing women and delivered to fetuses and neonates who exhibit infertility as they reach maturity.

The onset of the infertility crisis can be traced to the introduction of excessive amounts of MfG being made available to humans following the modernization of MSG manufacture in 1957.

Excitotoxic amino acids delivered to fetuses and neonates by pregnant and nursing women should be included as recognized risk factors for infertility.

Recognition of the fact that glutamate-induced brain damage in fetuses and neonates lies at the root of the fertility crisis, would be of immediate benefit to both patients and their health care providers, and serve as a valid starting point for ground-breaking research.

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