Original Article

An Investigation into the Role of Breastfeeding in the Development of Central Nervous System of Children in Islamic Texts and New Medical Sciences

Mehdi Eftekhar[1], Morteza Jarrahi[2]*

[1] Associate Professor, Islamic teaching Department, Semnan University of Medical Sciences, Semnan, Iran. [2] Assistant Professor, Department of Physiology and Research Centre, School of Medicine, Semnan University of Medical Sciences, Semnan, Iran.

Abstract

Background and Objectives: In Islamic texts and according to the results of the latest studies on the physiology of brain and nerves, child nutrition for 2 years has been considered appropriate. This study sought to clarify the effects of breastfeeding from the perspective of Islamic texts and neurosciences. **Materials and Methods**: This is a review study conducted using Islamic texts, library resources, and online reliable sources. **Results**: Modern sciences recommend 2 years of breastfeeding. Such a recommendation was clearly stated by the Holy Quran [Takwir, verse 8] and hadiths 1400 years ago. **Conclusion**: The reason why Islamic texts emphasize 2 years of breastfeeding pertains to the optimal brain development of children as well as the prevention of brain damages in newborn humans.

Keywords: Islamic Texts, Breastfeeding, Central Nervous System, Brain

Introduction

The word "Milk" as a kind of food has been repeated more than 15 times and breast milk more than 10 times in many verses of the Holy Quran mentioned as follows. Such repetition shows the significance of the issue. Milk is one of the blessings mentioned in the Holy Quran and expressed as part of animals' benefits for a human. From the perspective of religious resources and biological sciences, milk is a perfect food that plays an important role in supplying the other needs of the body in addition to water [1].

Materials and Methods

This is a review study in which related studies, authentic hadiths, and contents were extracted to evaluate breastfeeding according to the Holy Quran and its interpretation. Then, the related verses were separated and investigated according to their importance. Moreover, to confirm the compatibility of extracted materials with modern sciences, the data were collected through searching on the internet, databases, and valid scientific search engines (PUB MED, SCHOLAR GOOGLE, etc.) using the keywords "Holy Quran, milk, bioactive substances, brain evolution, and brain injuries" just in Persian and English languages and with no time limitation. Among the related references, articles, and books, the frequently cited cases with well-known and experienced authors were selected.

Results and Discussion

Breastfeeding and drinking milk in the Holy Quran

"Mothers may nurse their infants for two whole years, for those who desire to complete the nursing period" [Al-Baqarah: 233]. In general, according to the reasons to be mentioned, there is no suitable milk than mother milk for children. Therefore, according to the emphasis of this verse, the babies have the right to naturally spend breastfeeding period with taking advantage of their mother's milk so that they use the best food and immunologic support, favorable effects associated with it. "We have entrusted the human being with the care of his parents. His mother carried him through hardship upon hardship, weaning him in two years. So, give thanks to Me, and to your parents. To Me is the destination" (Luqman: 14]. "And we have enjoined upon man, to his parents, good treatment. His mother carried him with hardship and gave birth to him with hardship, and his

Address for correspondence: Morteza Jarrahi, Assistant Professor, Department of Physiology and Research Centre, School of Medicine, Semnan University of Medical Sciences, Semnan, Iran.
Email: arrahi44@yahoo.com

How to cite this article: Eftekhar, M., Jarrahi, M. An Investigation into the Role of Breastfeeding in the Development of Central Nervous System of Children in Islamic Texts and New Medical Sciences. Arch Pharma Pract 2020;11(S1):129-32.

gestation and weaning [period] are thirty months. [He grows] until, when he reaches maturity and reaches [the age of] forty years" [Ahqaf: 15].

Breastfeeding and drinking milk from the perspective of hadiths

On the importance of breastfeeding for children, the Holy Prophet (PBUH), Imam Ali (AS), and Imam Sadiq (AS) stated:

No milk is better than mother's milk for children[2]. No milk is more blessed than mother's milk for children[3].

Also, according to traditions, milk brings about wisdom, mental purity, eye-sight, and heart strength, and lessen amnesia[4]. Jurists have emphasized that mothers give their colostrum to their children [5] and that continuation of breastfeeding is better than leaving them (Mustaḥab) and is very stressed on[6].

In Islamic traditions, according to verse 15 of Surah Al Ahqaf, the minimal time of breastfeeding is 21 months while its optimal and complete-time has been mentioned 24 months according to verse 233 of Surah Baqarah.

In several traditions, the adequacy of breastfeeding in supplying water and food required for baby when it is exclusively used has been emphasized (up to age 6 months) so that even breastfeeding less than 21 months is cruelty to children[7]. So, what is today presented in the adequacy of breastfeeding in exclusive breastfeeding as a result of modern scientific studies has already been raised in the traditions of the Infallible Imams (*PBUH*)?

Prophet Mohammad (PBUH) said that God put the baby's ailment in the mother's breasts and water in part and food in the other part. From the child's birth, God puts his need every day proportionate to that day [8].

The view of the Holy Quran and Hadiths on the importance of breastfeeding in the intellectual evolution of human

In the Holy Quran's verses and Hadiths, the importance of breastfeeding and its positive effects have been mentioned. In the Holy Quran [Surah al-Baqarah, verse 233], completing a baby's body systems by breastfeeding has been mentioned.

By definition, wisdom is considered a kind of logical inference using knowledge and experience by cognitive brain activities and it has a relationship and overlap with intelligence [9]. In several traditions, wisdom has been emphasized to milk increases wisdom or memory, and the overall mental faculties of human. For example, the Prophet ordered pregnant women to feed babies with milk because it increases their wisdom[10].

Edited

The effects of breastfeeding on the development and function of the nervous system from the perspective of modern sciences

Mother milk contains the elements required for the development of a child's nervous system including three main categories of food: sugar, fat, and protein. Also, essential vitamins and minerals are present. Two essential amino acids i.e. cysteine and taurine that are important for physical growth and brain development, respectively cannot be produced in the baby's body; however, the only way to access this compound is through breast milk. Arachidonic acid and certain fatty acid docosahexaenoic acid called (DHA) are in breast milk and are very essential for the growth and development of the nervous system of the baby. The rate of linoleic acid in breast milk that is involved in the promotion and structure of brain development is 7 to 8 times higher than that in cow's milk.

Among bioactive compounds in mother milk, the neurological and developmental protective effects of nerve growth factor, thyroid hormones, and progesterone have been raised in the nervous system of a child. Nerve growth factor in milk, especially colostrum is essential for the growth and development of the baby's nervous system[11]. In hadiths mother's milk colostrum has also been emphasized[12].

Another compound erythropoietin is a good candidate for effects on the nervous system. In adulthood and fetal period, erythropoietin is mainly excreted from the liver and kidneys and in part of the brain. This compound is in breast milk and its effects on nerve protection and its role in nervous system development in children have been demonstrated[13, 14]. Also, studies have shown that erythropoietin stimulates the differentiation and maturation of oligodendrocytes and the proliferation of astrocytes and that such effect increases the ability of these cells to repair myelin and restore injuries in the nervous system[15]. Erythropoietin is capable of preventing hypoxic-ischemic brain injury[16]. Erythropoietin also has the role of protecting nerves and is effective in patients with epilepsy. So that daily injection of erythropoietin for one week immediately after the end of epilepsy reduces the early inflammatory response and reduces the risk of spontaneous incidence of the disease by adjusting the molecular changes after epilepsy[17].

As noted above, erythropoietin in human breast milk also plays an integral role in the maturation and evolution of the brain [13, 14, 18]. Studies show that the neurotrophic effects of erythropoietin are mainly in the proliferation and differentiation of cholinergic neurons [19]. Erythropoietin has therapeutic effects in subarachnoid hemorrhages and chronic cerebrovascular obstructions [20].

In addition to erythropoietin, progesterone found in milk can also affect brain cell function. In addition to the gonads and adrenal glands, progesterone will also be generated by neurons and glial cells in the peripheral and central nervous systems [21-23]. Progesterone, like other steroid hormones, is

formed from cholesterol [24] and its effects include neuroprotection, neuronal growth, and regeneration of nerve cells myelin[25]. Studies show that the injection of progesterone following brain injury improves nerve function[21]. Thyroid hormones that exist in breast milk also develop a wide range of effects on the nervous system. These effects include the formation, development, modulation of the brain function, and appropriate behaviors in creatures[26].

The effects of breastfeeding on cognitive activities and IQ of children from the perspective of modern sciences

Although human beings have been trying to provide all the components necessary for the growth and development of the child in replacing milk powder with breast milk, there is a significant relationship between IQ and cognitive development of children's activities and their use of breast milk[27-29]. In other words, breastfeeding is necessary for the optimal development of the baby's nervous system [30], and modern science also strongly emphasizes the positive impact of breastfeeding on children's cognitive activities and intelligence[27, 28, 30].

Duration of breastfeeding from the perspective of Islamic texts and modern sciences:

In the latter case, the scientific community including WHO, American Academy of Pediatrics and the Canadian Pediatric Society recommend 2 years of breastfeeding. As mentioned, such a recommendation was clearly stated by the Holy Quran 1400 years ago [Takwir, verse 8]. Another important issue is that scientific communities have announced the emergent duration for breastfeeding as 6 months and some others as 1 year. From the interpretation of Quranic verses, the emergent duration of breastfeeding can be inferred. In the interpretation of verse 15 of Surah-al-ahghaf, which expresses the duration of pregnancy and breastfeeding as 30 months, considering pregnancy which is 9 months, the breastfeeding duration is 21 months and if it is the case, the period of 21 months is the same emergent period for breastfeeding by the mother. If the duration of pregnancy is at least 6 months, the duration of breastfeeding in this verse is the same as 24 months.

Conclusion

According to the contents listed on the effects of breastfeeding on the development and function of the nervous system from the perspective of modern science, we can see that the beneficial effects of breastfeeding on infant neurological development eventually lead to promote human cognitive activities and IQ. It is more evident that the views have lots of things in common when the above-mentioned views are compared with the views of the Quran and hadiths on the importance of breast milk in human evolution. Also, given that intellect, insight, vision, and knowledge is part of the function of the central nervous system i.e. human brain, it is clear that among the organs of the human body, the nervous system has a special place and that God is wise for its high value. Although there are compounds in breast milk necessary for the development of all the organs of the human body, he pays special attention to the effective compounds in the development of central nervous system or compounds that are protective of the nervous system so the list of biological substances that affect the human nervous system and are available in breast milk have distinct advantages over the rest of the ingredients and are increasing along with the progress of science.

That expert of modern sciences believes that breastfeeding by the mother for 2 years is necessary and the recommendation by the Holy Quran for breastfeeding within 2 years 1400 years ago is considered a scientific miracle is not new. The primary objective of this study was to uncover the hidden aspects of the mystery of the importance of breastfeeding by a mother from the perspectives of the scientific aspects of neuroscience and cognition compared to the views of the Quran and Hadith in this regard. The emphasis on the part of experts of modern science on breastfeeding by mother for 2 years that plays an important role in neurological development and the prevention of common nerve damage and a prerequisite for the development of human wisdom, understanding, insight, and knowledge indicate the strong agreement in the field of science and the Quran in breastfeeding by mother.

Acknowledgment:

We appreciate the help of academic members of the Islamic teaching Department and Physiology and Research Centre for doing this investigation.

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