

A Preventable Cause of Neurodevelopmental Retardation and Swallowing Disorder in Infancy Period: Deficiency of Vitamin B₁₂

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Background: Vitamin B₁₂ has a quite important function in the process of fat, carbohydrate and protein metabolism of the human organism. Because of its producing is not possible in the human organism, the vitamin should be taken by food which they are animal products.

Case Presentation: We aimed to draw attention to that it is one of the preventable cause of neurodevelopmental retardation of vitamin B₁₂ deficiency with 2 cases presentation whose presented with complaints of delay to tonic neck reflex and delay of ability the sit with support and they were quickly recovered after diagnosed and treated for vitamin B₁₂ deficiency.

Conclusion: Level of B₁₂ which may be cause of permanent neurological damages, can be necessary detected in pregnant women and infancy, in this way, the neurological morbidity of due to B₁₂ deficiency can be prevented with early diagnosis.

Keywords: Neurodevelopmental Retardation, Swallowing Disorder, Deficiency, Vitamin B₁₂

Introduction

Vitamin B₁₂ has quite an essential function in the process of fat, carbohydrate and protein metabolism of the human organism (1-4). Because its produce is not possible in the human body, the vitamin should be taken by food of animal products. Since other than its functions in the metabolism reactions, it also necessary for the synthesis of neurons and neurotransmitters, Vitamin B₁₂ one of the

most essential molecules(5). Brain development starts with fetal life, and even though an essential part of the event completed, this process continues during the breastfeeding period (2,5,6). Also, myelination occurs during this period. Because of these reasons; vitamin B₁₂ deficiency during the fetal life and breastfeeding period may cause neurological and neurodevelopmental disorders (1, 3, 4). B₁₂ deficiency continues as a significant public

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health problem especially in developing countries (7, 8).

In this study, we aimed to draw attention to that it is one of the preventable cause of neurodevelopmental retardation of vitamin B₁₂ deficiency with 2 cases presentation whose presented with complaints of delay to tonic neck reflex and delay of ability the sit with support and they were quickly recovered after diagnosed and treated for B12 deficiency.

Case Presentation

Case 1

She was five months and eight days old girl case. The physical examination of her in the family practice was detected as a delay to tonic neck reflex. It was learned from her medical history that; she was term birth, 2760 grams born with standard vaginal delivery and when she was born her was given to her mother for breastfeeding. Hypoxic features were not identified in the patient's history. No other nutrients were given to her other than human breastmilk; it was found that regular control data of gaining weight were compatible with her peers.

On examination; the general condition was good, skin turgor tone was normal. However, the patient's whose growth and development parameters were compatible with peers had a neurodevelopmental delay. It was detected in the patient's analysis of light iron deficiency and vitamin B₁₂ deficiency (95 pg /dL); there were no pathological findings with other systemic examination. Blood gas analysis, ammonia level results were normal. Indeed the mother also had low vitamin B₁₂ (126 pg/dL) levels. Both the mother and her baby have treated for vitamin B₁₂ deficiency. This baby was follow-up with outpatient in terms of neurodevelopment, firstly

weekly, then twice monthly. The patient's visit at the 10th week it was detected an improvement in the ability of tonic neck reflex. Patient's routine controls are ongoing in healthy child clinic.

Case 2

He was 2 months and 26 days old boy. The physical examination of his in the family practice was detected as reduced weight gain. It was learned from her medical history that; he was term birth, 3050 grams born with standard vaginal delivery and when he was born, his was given to his mother for breastfeeding. And also it was learned that; no problems occurred in the first 6-8 weeks his own life but, last three weeks almost every the feeding there was a problem, he was sucked well but not swallowed, he was vomiting in the form of salvation. Hypoxic features were not identified in the patient's medical history. No other nutrients were given to her other than human breast milk; it was found that regular control data of weighing were compatible with her peers. On the physical examination, the general condition was good, skin turgor tone was normal. Growth and development parameters were consistent with the patient's peers. In the patient's assessment, the tonic neck reflex, coordination skills of sucking and swallowing were found to be incomplete. There was no pathological feature in renal and liver function tests and complete blood count. Blood gas analysis, serum ammonia level results were normal. The patient's vitamin B₁₂ level was 118 pg/dl, and his mother's vitamin B₁₂ level was 189 pg/dL. Both the mother and her baby have treated for vitamin B₁₂ deficiency. Also, he was given a probiotic solution (Bifidobacterium spp Probiotic, Maflor, Mamsel) was given the patient who had mild oral candidiasis and

nutritional intolerance through 10 days. The baby was follow-up with outpatient in terms of neurodevelopment, firstly weekly, then twice monthly. The patient's visit at the 9th week it was detected an improvement in the ability of tonic neck reflex and coordination skills of sucking and swallowing. Patient's controls are ongoing in healthy child clinic.

Discussion

Animal foods are a source of the vitamin B₁₂ that plays a critical role in many vital reactions in the human organism (1-3). Vitamin deficiency is mainly seen in those who vegetarian nutrition dieters and cannot consume enough of the foods due to economic reasons. This situation can be a significant cause of morbidity especially for newborns of mothers with vitamin deficiency. In babies of mothers with vitamin deficiency are caused with various neurological complaints, such as difficulty in swallowing, in delay of neuromotor development or regression of acquired neuromotor development (1,4,5,7-10).

By widespread nature of marriages in our region, patients with neurological developmental retardation is exposed to many tests especially in terms of metabolic diseases (1, 6, 8). By the literature, in our study, complaints of the cases were detected as delay in tonic neck reflex in our first case, in the second case, inability to weight gain and inability of sucking-swallowing coordination. The patients who had Vitamin B₁₂ deficiency were behind from their peers in terms of neurodevelopmental. Also, in second patients who inability of sucking-swallowing coordination was detected mild oral candidiasis. Because of, nutrition intolerance and mild oral candidiasis gave also a probiotic solution to this patient. The literature reported

that, newborn babies who had nutrition intolerance were treated with probiotics (11).

Both the increase of body mass and the neuromotor development are very fast in the breastfeeding term in terms of growth and development. Therefore, vitamin B₁₂ deficiency in this period can cause neurological damage (5, 7-9). It is stated in the literature that the lack of diagnosis and treatment of vitamin deficiency during this period may cause permanent neurological diseases (1, 2, 6, 9).

In the literature; the most common complaints in patients were unconcernedness to the environment, pallor, weakness, difficulty in nutrition, regression in sucking and swallowing coordination, decrease in gaining weight, inability of tonic neck reflex, delayed supported-unsupported sitting, irritability, hypotonia, mental-motor retardation, reduction in deep tendon reflexes, encephalopathy, and epileptic seizures, hyperpigmentation and involuntary movements on joint surfaces (7-10). In our study, the patients' complaints were similar to the literature.

The duration of deficiency of vitamins is significant in the progression of neurological pathologies due to vitamin B₁₂ deficiency (3-5). Speedy clinical and laboratory recovery can be seen in the cases diagnosed and treated especially during early breastfeeding period time. However, delays in treatment can be causes permanent neurological damage (9, 10). Similar to the literature, in our study, in vitamin B₁₂ deficiency diagnosed and treated in the early breastfeeding term, clinical and laboratory improvement were quickly observed.

The benefits of breastfeeding are undisputed in the infancy period, and mothers should be encouraged to breastfeed unless there is a

contraindication. Therefore, when it is detected vitamin B₁₂ deficiency, both the mother and the baby should be treated, and breastfeeding should be continued. In this way, breastfeeding is also supported (12). In the literature, about the neuromotor and neurodevelopmental symptoms which they occur due to vitamin deficiency in the breastfeeding time enough data for their long-term progression are not reported, however, with long-term, follow-up studies can be obtained ideas (1-3, 6).

As a result, we think that the level of B₁₂ which may be the cause of permanent neurological damages, can be necessary detected in pregnant women and infancy, in this way, the neurological morbidity of due to B₁₂ deficiency can be prevented with early diagnosis.

Conflict of Interests

The authors declare that they have no conflict of interest in the current study

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