CASE REPORT

Extreme malnutrition in an infant of Ethiopian origin with Down’s syndrome

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Abstract Observation of an Ethiopian infant with Down’s syndrome with severe malnutrition, and reflection on the effect that the social and health conditions in Ethiopia had on the causes leading to this extreme situation.

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PALABRAS CLAVE
Síndrome de Down; Malnutrición extrema; Países de renta baja

Resumen La observación de una lactante de origen etiope con síndrome de Down y malnutrición grave permite reflexionar sobre las condiciones sociales y sanitarias de Etiopía y las causas que han posibilitado que se llegue a esa situación extrema.

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Introduction

A genetic syndrome is an approximately constant association of different anomalies that have genetic disorder as their common origin.

These disorders are well known in Down’s syndrome and depend on the gene 21 Trisomy in the body’s cells.1

Besides the most well-known anomalies of Down’s syndrome, there are also very frequent feeding difficulties and poor nutritional status of some patients. The late development of nutritional skills can also hamper the adequate intake of nutrients.2 When other problems associated with eating, drinking or swallowing are found, a state of malnutrition can be reached.3 Muscular atrophy, anaemia, food intolerance, constipation and gastrointestinal discomfort are also potential symptoms and signs related to the syndrome.

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Extreme malnutrition in an infant of Ethiopian origin with Down’s syndrome

Although, in most developed countries, children with Down’s syndrome have a tendency to be overweight or obese, in countries with limited resources the trend is reversed, with more cases of malnutrition.

There are three types of malnutrition: a) caloric or marasmus; b) protein or kwashiorkor, and c) protein-caloric or mixed.

a) An individual with marasmus type malnutrition has a cachectic appearance, with a decrease in skin folds, loss of fat reserve and decreased muscle mass anthropometric measurements, such as arm circumference. Analytical values for albumin and protein are usually normal or slightly altered.

b) Protein or kwashiorkor malnutrition is characterised by the presence of oedema, pressure sores and difficulty in healing. Laboratory tests show low levels of protein, albumin and transferrin. The prognosis for these patients is poor, even with intensive nutritional therapy. It is common in underdeveloped countries where food consumption is based on grain and there are few protein sources.

c) Mixed or protein-caloric malnutrition is a combination of both types, and usually occurs in chronic marasmic individuals undergoing stress due to acute conditions, adding the condition of kwashiorkor to the marasmic one.

The therapeutic approach for each type of malnutrition is different. If the individual is in a hypercatabolic state, as in kwashiorkor, more intensive nutritional therapy is applied; while a marasmic individual requires gradual renutrition. If the malnutrition is mixed, an assessment should establish which component dominates, and thus choose the most appropriate nutritional therapy and avoid the complications that may arise in each case.

A complete blood count and biochemical analysis, with a metabolic examination for iron, zinc, prealbumin, albumin, immunoglobulins and liver function, are normally required to make a good diagnosis of the type of malnutrition.

In general, all children with a disability are at nutritional risk. They must therefore be controlled, and an improvement in nutritional status helps their development. Several authors confirm that a balanced diet must be followed, without food restrictions and with adequate micronutrient supplements combined with proper physical activity to prevent vitamin and mineral deficits in these patients.7

Nutritional problems associated with the syndrome are exacerbated by growth. However, they are less frequent for breastfeeding infants, as they use very basic or innate reflexes and mechanisms, such as detection, suction, swallowing and coordination with breathing.

We report the case of an infant with Down’s syndrome and severe nutritional problems.

Case report

A 3-month-old girl brought to the emergency department of a rural hospital (Gambo Hospital) in southern Ethiopia on August 2, 2009 with “extreme malnutrition” (fig. 1). She was the 7th child born to a healthy 27-year-old mother who had had other children who were healthy.

An examination showed facial features consistent with Down’s syndrome, with four finger line on both hands, heart murmur suggesting atrial septal defect and severe malnutrition. The anthropometric parameters showed a weight of 2.45 kg (−3 θ), a height of 51 cm (−3 θ), a BMI of 9.42 kg/m² (−3 θ) and greatly diminished perimeters and skin folds (−3 θ).

According to the food questionnaire taken by the mother, it was determined that the patient was malnourished as a result of inadequate food, both quantitatively and qualitatively.

It was not possible to conduct any additional tests for the nutritional status of the girl, such as laboratory analyses (e.g., albumin) or a body composition analysis.

Food reintroduction therapy was started.

Although there is no consensus, food reintroduction should be done gradually and the volume of enteral formula should be phased out over the following 3 weeks.

Over the 2 weeks she was with us she improved, however, her current situation is not known.
Discussion

As well as being a humanitarian act, participating in this kind of healthcare activity (the Proyecto solidario de cirugía plástica infantil [Child Plastic Surgery Charitable Project] established by the Instituto de Malformaciones Faciales [Facial Deformities Institute] in 2004 for developing countries with limited resources, such as India and Ethiopia.) involves treating patients with extreme clinical problems which are currently very difficult to observe in our environment.

The treatment of this patient led to two observations:

1. Comparisons between the social, economic and health conditions in Spain and Ethiopia were made (table 1). Firstly, there is a large difference in the fertility rate, birth rate and infant mortality in children under 1 year old. Secondly, almost half of children under 5 are malnourished. Additionally, although the incidence of Down’s syndrome in Ethiopia is unknown, it is known to occur in \( \frac{1}{10000} \) births, regardless of country or race, so the number of children with this syndrome must be very high.

2. Considering these figures, it was difficult to determine the main causes leading to such a state of malnutrition in this infant, although we considered 4 possible causes:
   - The first is the fact of being born in a country like Ethiopia with limited resources. Although the mother seemed well, the diet is usually deficient in proteins, which are essential for growth and especially during lactation.
   - The second possibility is due to the sex of the child, and the possibility that being a girl meant the maintenance of good nutritional status was not prioritised.
   - The third is due to having Down’s syndrome, which meant proper feeding was difficult.
   - Fourthly, a country like Ethiopia has no public health service.
   - However, we believe the cause of malnutrition in this infant was not a single factor, but a combination of all the four previous points.

Acknowledgements

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Bibliography


Recommended websites

www.fcsd.org
www.who.int/childgrowth/standards/en
www.msc.es
www.guiadelmundo.org.uy
www.Malformacionesfaciales.es

Table 1  Demographic Data Comparison between Spain and Ethiopia

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<thead>
<tr>
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<th>Ethiopia</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth rate</td>
<td>36.8 births/1000 inhabitants</td>
<td>9.72 births/1000 inhabitants</td>
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<tr>
<td>Infant mortality rate</td>
<td>90.2 deaths/1000 births</td>
<td>4.21 deaths/1000 births</td>
</tr>
<tr>
<td>Incidence of Down’s syndrome</td>
<td>Unknown</td>
<td>7.5/10 000 births</td>
</tr>
<tr>
<td>Fertility rate</td>
<td>5.4 children/woman</td>
<td>1.3 children/woman</td>
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<tr>
<td>Mortality in children under 1 year</td>
<td>110/1000 live births</td>
<td>3/1000 live births</td>
</tr>
<tr>
<td>Infant malnutrition</td>
<td>47% under 5 years</td>
<td></td>
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<tr>
<td>Mothers who breastfeeding for up to 6 months</td>
<td>55%</td>
<td>10%</td>
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