

Use of Ass' Milk in Multiple Food Allergy

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Summary: We report a study of realimentation techniques in 9 unweaned infants with multiple food hypersensitivity. The patients had presented severe symptoms of cow's milk allergy and successive attempts using milk containing soy protein and/or a semielemental formula in their alimentation did not improve their clinical condition, due to the onset of hypersensitivity to these allergens as well. After a short period of parenteral alimentation the infants were re-fed per os with ass' milk (250 ml/kg/day) +

medium chain triglycerides (40 ml/L milk). This food was well tolerated by all patients. No negative clinical reactions were recorded and during hospitalisation average weight increase was 39.8 g/day. The follow-up of the patients showed that ass' milk was tolerated without any problems up to an age ranging from 15 to 20 months, when cow's milk was reintroduced in some patients. **Key Words:** Food hypersensitivity—Realimentation—Ass' milk—Growth.

Food allergies are one of the most frequent causes of malabsorption and growth deficiency in unweaned infants in the first few months after birth. In fact, it has been reported that cow's milk protein hypersensitivity alone affects 2–7.5% of the general population (1,2), and the diagnostic incidence of this pathology is certainly on the increase, as shown by the 1:200 diagnoses recorded in Stockholm in 1979 (3) compared with the 1:7,500 recorded in 1948 (4). However, it is well known that cow's milk proteins represent only some of the many possible allergens that can trigger food hypersensitivity reactions; in fact, there are well-documented reports in the literature of cases of allergy to soya (5,6), hydrolyzed casein (7), rice (8), and other foods. Furthermore, these rarer food hypersensitivities are known to be more frequent in patients initially allergic to cow's milk proteins (1,2,9); therefore, in these cases, there is a multiple food allergy, which is a difficult condition to treat.

The present work reports the clinical data of 9 patients with multiple food allergy treated by us over the last 2 years and initially re-fed exclusively with ass' milk.

CASE REPORTS

All subjects studied had been fed since birth with different commercially available formulas containing cow's milk protein. Table 1 summarizes the clinical characteristics and the foods triggering hypersensitivity reactions in the patients. As can be seen, the onset of symptoms in all patients occurred during the first month after birth and in four of them immediately after birth: In these latter cases the first sign of food intolerance was that there was no, or very little, weight increase. In 3 of the 4 patients suffering from cow's milk protein hypersensitivity since birth, retarded growth was accompanied by vomiting a few minutes after a milk feed; as the growth deficiency in these patients was considerable, laboratory tests were performed to confirm the suspected cow's milk protein hypersensitivity. Prick tests (Lofarma, Milan, Italy) using β -lactoglobulin, lactoalbumin, casein, and full-cream milk were positive for at least one of these allergens in all infants; in two patients (cases 7 and 8 in Table 1), eosinophilia was found (600 and 700/mm³, respectively); all patients had occult blood in stools; three patients (cases 1, 4, and 7) had eosinophils in the fecal mucus. In the other five patients included in the study, symptoms appeared between 7 and 20

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TABLE 1. Relationship between symptoms and foods in the nine nurslings affected with multiple food intolerance

Case	Age at onset	Age at hospitalization (days)	Cow's milk	Soy milk	Hydrolized milk	Hypoallergenic diet
1. AC, m	Since birth	30	Failure to thrive, vomiting (1-15)	Diarrhea, vomiting (16-30)	Vomiting, regurgitation (31-37)	Diarrhea (38-48)
2. RC, m	12 days	49	Diarrhea, vomiting (1-15)	Diarrhea (16-48)	Shock (49)	Bloody diarrhea (50-55) Diarrhea (61-70)
3. AL, m	20 days	60	Diarrhea, vomiting (1-30)	Bloody diarrhea (31-42)	Urticate (43-60)	Diarrhea (32-36)
4. AG, f	Since birth	26	Failure to thrive, vomiting (1-19)	Diarrhea, vomiting (20-26)	Diarrhea, vomiting (27-31)	Diarrhea (32-36)
5. GG, m	11 days	47	Failure to thrive (1-25)	Diarrhea (26-34)	Diarrhea, vomiting (35-47)	Bloody diarrhea (48-51) Diarrhea (54-59)
6. GR, f	7 days	53	Diarrhea, vomiting (1-13)	Bloody diarrhea (14-49)	Bloody diarrhea (50-53)	Diarrhea, vomiting (80-86)
7. LZ, m	Since birth	79	Failure to thrive (1-56)	Diarrhea, vomiting (57-64)	Failure to thrive (65-79)	Diarrhea, vomiting (86-88)
8. AN, f	Since birth	74	Failure to thrive, vomiting (1-60)	Diarrhea (61-74)	Failure to thrive, diarrhea (75-85)	Diarrhea (53-59)
9. FG, m	20 days	52	Diarrhea, vomiting (1-48)	Bloody diarrhea (49-50)	Bloody diarrhea (51-52)	

Numbers in parenthesis indicate the days of administration of different foods since birth.
m, Male; f, female.

days after birth. In case 5 in Table 1, the lack of weight increase was the only symptom which led us to suspect cow's milk protein hypersensitivity; this diagnosis was then confirmed by positive Prick tests for lactalbumin and betalactoglobulin, by eosinophilia ($600/\text{mm}^3$) and by the presence of eosinophils in the fecal mucus. In case 2, 3, 6, and 9 of Table 1, the initial symptoms were diarrhea and vomiting; in these cases, vomiting occurred within 30 min after feeding, and the diarrhea was characterized by the presence of great deal of mucus. In these patients, Prick tests were also positive for at least one of the allergens tested, eosinophils were detected in the fecal mucus of the all patients, and in two cases (cases 2 and 6) occult blood in stools was positive.

In all these patients, the microbiological examination of the stools did not show any pathogenic germs. Moreover, it must be underlined that in another three patients in our group, before the onset of the symptoms that led to a clear diagnosis of cow's milk protein allergy, prolonged fits of crying had been recorded immediately after birth and a diagnosis of "gaseous colic" had been made.

Family history was positive for atopic diseases in four of the nine patients observed; in these subjects, one parent and/or one sibling suffered from dermatitis or rhinitis or allergic asthma. The diagnosis was confirmed by intestinal biopsies performed before and after successive challenges in each patient at varying intervals after diagnosis. Figures 1 and 2 show the aspect of intestinal mucosa both before

and after challenge in one of the study patients; it can be seen that 24 h after ingestion of cow's milk the mucosa appears damaged with a partial atrophy of the villi and with a lymphocyte infiltration of the lamina propria. The aspect of the mucosa of this case after challenge is similar to that observed in all patients after challenge.

After the introduction into the diet of a formula containing soy-protein, there was an initial regression in symptomatology in all patients, except one (case 4 in Table 1), followed by the onset of overt soya allergy enteritis; in three cases (case 3, 6, and 9) diarrhea was accompanied by the presence of bright red blood in the feces and bioptic findings on the rectal mucosa confirmed the diagnosis of "eosinophilic colitis."

In all the other cases, after a period ranging from 5 to 30 days after the administration of soy milk, severe diarrhea was observed (8-10 evacuations/day) with the presence of mucus and occult blood in the feces, accompanied in some cases by vomiting within 30 min after feeding with milk. In all patients, the microbiological examination of the stools did not show any pathogenic germs.

In this case, once again, the diagnosis of soy-hypersensitivity was confirmed by the clinical reaction to the challenges performed in the hospital and by intestinal biopsy, which showed widespread damage of the mucosa after the challenge. Therefore, a commercially available semielemental formula (Alfaré, Nestlé) was used. The composition of this formula was for 100 g of powder: fats 23 g me-

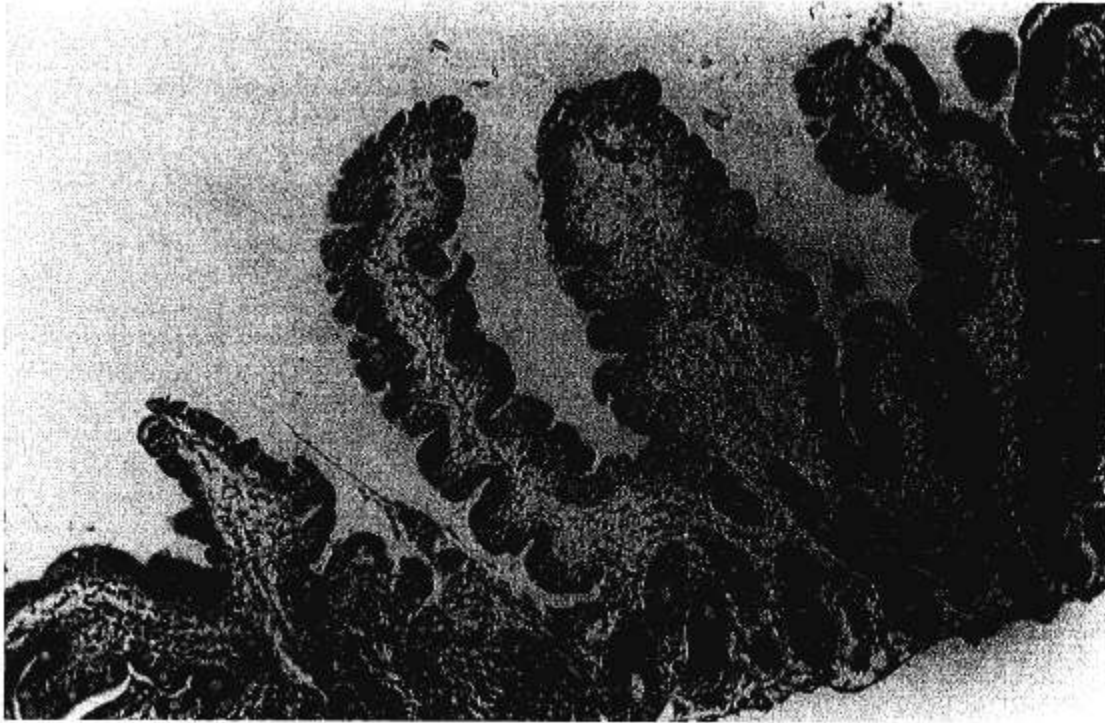


FIG. 1. Aspect of intestinal mucosa before challenge with cow's milk in a study patient.

dium chain triglyceride (MCT) 11.5 g, milk fats 6.9 g, and corn oil 4.6 g; protein hydrolysate 18.2 g; and total carbohydrates 51.7 g. In all cases, this treatment was suspended after a short period of time: The formula was used for a maximum of 18 days without obtaining any remission in symptomatology except in one case (case 3 in Table 1); in this pa-

tient, the diarrhea initially disappeared, but 48 h after the introduction of the new diet, however, a diffuse rash was observed and the new formula was consequently suspended. It is also important to note that one infant (case 2) suffered from severe anaphylactic shock a few minutes after receiving the semielemental formula. Moreover, in all pa-

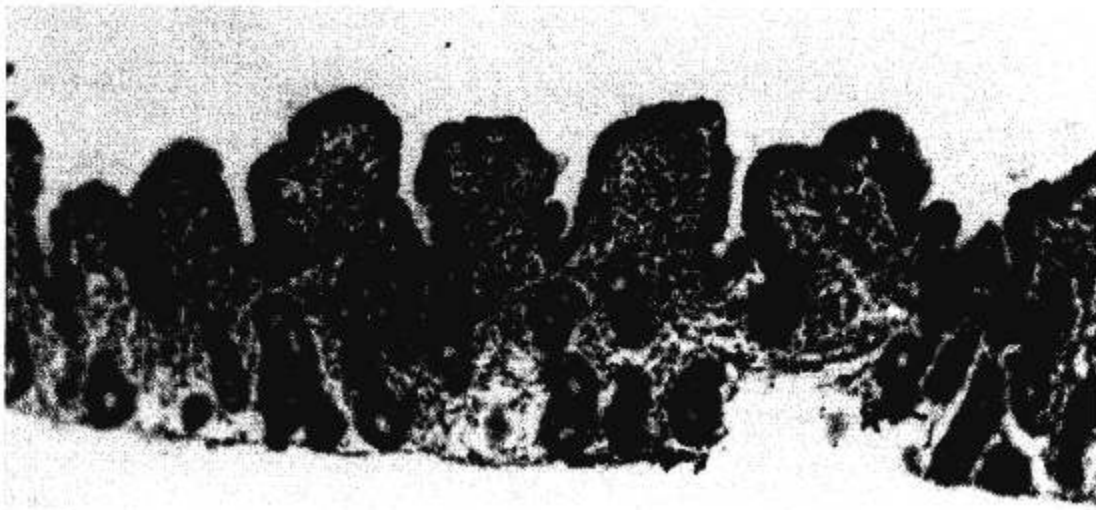


FIG. 2. Aspect of the intestinal mucosa 24 h after ingestion of cow's milk in the same patient.

tients, laboratory data that were positive for the diagnosis of food allergy enteropathy persisted abnormal (occult fecal blood positive, eosinophilia, eosinophils in fecal mucus).

Even a successive treatment using a hypoallergenic diet composed of ground rice cream, homogenized chicken, and olive oil did not lead to a regression in symptomatology in the cases we observed. At this point, our patients were placed on total parenteral alimentation for a period of 5–15 days. In order to regain the normal absorptive function of the intestine as soon as possible, we began realimentation per os with MCTs and ass' milk; the latter was given diluted 1:1 with water during the first 24 h and then increased to the normal concentration within 48 h. The ass' milk was administered at a dose of 250 ml/kg/day. The MCTs were given at a daily dose of 40 ml/L of milk. The introduction of ass' milk into the diet caused no allergic reactions in the infants; the alvus was regular, no fecal mucus was observed, plus occult fecal blood tests were negative. No patient suffered from vomiting and there were no respiratory nor cutaneous allergic reactions. Laboratory tests showed the absence of eosinophilia and fecal eosinophils in all patients. At 24 h after the introduction of ass' milk into the diet, the infants were visibly more vivacious and successively a considerable weight increase was observed. The ass' milk and MCTs were thus the only foods given to these babies for an average period of 25 days (range, 15–35 days); at a later stage, cereal flours, olive oil, and meat were carefully reintroduced. Table 2 shows the composition of ass' milk compared with human and cow's milk (10). It can be seen that the composition of ass' milk is much more similar to human milk than is cow's milk. Furthermore, the protein content is such that it does

TABLE 2. Composition of ass' milk compared with human and cow's milk

Composition (g/c)	Ass' milk	Human milk	Cow's milk
Total protein	16	13	35
Casein	8	6	30
Albumin + lactoglobulin	8	7	5
Fat	10	35	37
Lactose	60	68	47
Inorganic substances	5	2	7
Calories/liter	450	680	680

Data from ref. 10.

TABLE 3. Daily mean weight increase during the period of hospitalization and the percentage of body weight with respect to the ideal weight (50th centile) recorded on discharge from hospital and 3 months later

Case	Weight increase (g)	Percentage body weight on discharge	Percentage body weight 3 months later
1	30	75	97
2	32	70	90
3	38	78	94
4	45	66	80
5	28	63	78
6	30	74	83
7	50	70	91
8	65	69	83
9	40	72	81
Mean ± SD	39.78 12.05	70.78 4.60	86.33 6.78

not produce the excessive renal load of solute associated with cow's milk, and the lactose content makes the ass' milk more palatable. It is clear, however, that as the fat content and, therefore, caloric value of ass' milk is low, it should be complemented with MCT to reach the daily caloric intake recommended during the phase of growth recovery in dystrophic patients (11,12).

Table 3 shows the daily weight increase during the period of hospitalisation and the percentage of body weight with respect to the ideal weight (50th centile) recorded on discharge from hospital and 3 months later during the follow-up of our 9 patients. It is clear that the growth response of these small patients was satisfactory and that growth continued regularly even after discharge, thus permitting continuous weight recovery.

The clinical follow-up confirmed the absence of symptoms in the patients and the negative objective examinations. Furthermore, laboratory data and blood tests indicated the normalisation of protine-mia and all the other nutritional indices. In three of the nine patients observed by us, cow's milk was carefully reintroduced into the diet at an age of 15–20 months: There were no appreciable clinical reactions or alterations in the laboratory examinations performed (blood xylose level 1 h after load, blood leukocytes count 6 h after challenge, and occult fecal blood). The other infants followed up for an average of 6 months are still following a diet without cow's milk and its derivatives, soya, chicken, or rice; they still receive ass' milk, and

their growth rate and clinical conditions are absolutely satisfactory.

DISCUSSION

Although the remarkable progress made in the field of parenteral nutrition has led to a consistent improvement in the prognosis of serious multiple food intolerance (13), the necessity to reintroduce alimentation per os as soon as possible to stimulate the functional recovery of the damaged intestine (14,15) is still universally accepted.

In this respect, breast feeding is considered the safest method of realimentation (16). However, it is obvious that human milk is not often readily available, and, therefore, other efficacious solutions have been sought. The use of formulas containing soy protein can, however, cause severe soy hypersensitivity reactions (17), as in the cases we have described.

In our experience, the use of ass' milk can offer an important solution for the treatment of infants with multiple food intolerance; this food has the basic value of being extremely similar in composition to human milk and because it integrates the fat content it could eventually represent a very valid alternative. The high lactose content not only makes it pleasant to eat for the nursing, but it is also qualitatively preferable to a semielemental formula containing protein hydrolysates or soy formulas which contain carbohydrates other than lactose.

In fact it is also known that lactose stimulates the intestinal absorption of calcium (18) and this can have a favorable effect on bone mineralization in the first few months after birth; it could, therefore, be concluded that in areas it is readily available, ass' milk is certainly preferable to a lactose-free artificial dietary milk. In addition, the renal load of solutes, mainly determined by the amount of proteins and inorganic substances in the diet, is substantially very similar in both breast-fed infants and those fed with ass' milk. Therefore, it is not necessary to dilute ass' milk before feeding it to infants; this represents a considerable advantage considering the lower fat, and obviously caloric, content of ass' milk compared to cow's milk.

In conclusion, we believe that the use of this nat-

ural food, which in our experience has proved to be very useful in successfully treating the more complex cases of multiple food intolerance, should be encouraged.

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