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Case Report

Ayurveda in the management of infant hyperlipidemia: A case report

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ABSTRACT

Hypertriglyceridemia is a rare disorder in childhood. Familial Chylomicronemia Syndrome (FCS) is a rare genetic disease that leads to severe hypertriglyceridemia, often associated with recurrent episodes of pancreatitis. In this syndrome, traditional lipid-lowering drugs are marginally effective. A 6-months-old infant with complaints of recurrent episodes of abdominal colic and pancreatitis, with S. Cholesterol 552 mg% and Triglycerides 6400 mg%, was treated with Ayurvedic medicines. After six months of medication, Serum Cholesterol levels were within normal limits, and within the three years of regular treatment, S. Triglycerides was under 2000 mg%. Recurrent episodes of acute abdominal colic and vomiting reduced significantly. The patient was treated for *Kapha Pitta dushti in Rasa* and *Raktavah srotas* (deformity of the *Kapha Pitta* humors in the tissue nourishment pathway of the first and the second tissue respectively). Laghoo Sootshekhar, Arogyavardhini, *Tinospora cordifolia*, Cyprus rotundus, *Aegle marmelos*, *Berberis aristata*, *Vettiveria zizanioides*, and *Triphala* were the medicines used frequently. The three years treatment was safe and effective. Cost-effectiveness was an added feature of this treatment. Clinical experience of this case shows that congenital hyperlipidemia can manage by Ayurvedic medicine.

1. Introduction

Congenital hyperlipidemia has become a challenge due to the paucity of data on its prevalence. There is no information available in the peer reviewed literature about the prevalence and etiology of extreme high triglycerides in children. In India, several cases were reported in very young children aged between 20–60 days [1]. Hypertriglyceridemia in children is classified as genetic, acquired, and genetic- acquired [2]. Genetic abnormalities are rare and generally diagnosed soon after birth. Severe Hypertriglyceridemia, Hepatosplenomegaly, Xanthomas, Lipemia Retinalis, and Pancreatitis are the features of Familial Chylomicronemia Syndrome (FCS). It is a rare syndrome with a prevalence of 1 in 1 million for homozygote and 1 in 500 for heterozygote. Its presentation is heterogeneous in a very young age group. The most life-threatening complication of FCS is severe and recurrent episodes of acute pancreatitis. The ratio of TG/TC above 2.2 mmol/L or above 5 ml/dl indicates a high level of circulatory Chylomicronemia. No definite treatment for dyslipidemia in infants is yet proved effective and safe [1]. In FCS safety and efficacy of traditional lipid-lowering agents such as Fibrates, Omega 3, Statins, and Niacin are still in question [3]. The affordability of the treatments like Plasmapheresis is an issue in India. Also, an extremely low-fat diet and avoiding simple carbohydrates for lifelong is challenging, particularly in children. Safe and cost-effective treatment is a necessity for prolonged treatment of congenital hyperlipidemia.

Hyperlipidemia in infants is not in Ayurveda treatises. In adults, it considers as a *Santarpanjanya vyadhi* (overnutrition disease) with *Medo dhatu dushti* (fat tissue abnormality) [4]. The treatise of *Sushruta* described the causes of diseases as *adi bala pravrutta* or *beeja dushti* (genetic) and *janma bala pravrutta* (acquired) - *Rasakrita* (congenital disease due to dietary indiscretions of the mother during pregnancy) [5].

2. Patient information and clinical findings

2.1. Case history

A 6 months male baby visited the physician with complaints of recurrent episodes of acute abdominal colic followed by green-colored vomiting and loose motions. He has been admitted twice to the NICU within five months. The very first episode was at the

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Table 1
Blood reports of the hyperlipidemia case before treatment.

	Age	CH	TG	LDL	HDL
Reference Range*		**130–200 mg%**	**30–150 mg%**	**50–130 mg%**	**35–80 mg%**
14/11/2009	One mth	515	3475	114	27
07/01/2010	Two mth	1040	6270	NA	NA
22/02/2010	Four mth	552	6400	NA	NA

CH: Cholesterol, TG: Triglycerides, LDL: Low-density lipoproteins, HDL: High-density lipoproteins. * Adult Treatment Panel III Recommendation by NCEP, ** RXL System Pediatric reference range.

age of one month. The investigations revealed lipemic blood, acute pancreatitis, splenomegaly, mild ascites, and bilateral lipemia retinalis [Table 1]. The serum sample of lumbar puncture also found to be lipemic. The pediatrician, after consulting the endocrinologist, diagnosed it as Congenital Hyperlipidemia. The second similar episode was at the fourth month. The treatment suggested by the pediatrician was unaffordable, and the parents came for the ayurvedic intervention.

2.2. Obstetric history

The primigravida mother was on protein supplements and a high protein diet when the USG noted mild IUGR in July 2009 (Gestational week-25weeks + 5 days). The cervical cerclage was done and the mother was asked to follow strict bedrest to avoid preterm labor in Aug 2009. The USG noted fetoplacental insufficiency, reducing the diastolic flow in the umbilical artery and oligohydramnios on 14th and 29th Sept. 2009, respectively.

LSCS was required due to fetal distress in the first stage of delivery.

2.3. Family history

Both the parents had normal lipid profiles, unaware of any hyperlipidemic family history

2.4. Genetic history

The parents are first cousins and refused the genetic testing suggested by the endocrinologist

3. Physical examination findings

Darshana (Inspection)*:* On examination, the baby was active and was without pallor and xanthomas.

Sparshana (Palpation)*:* The liver and spleen were not palpable.

Prashna (Questioning)*:* His birth weight was 2.2 kg, and he achieved the developmental milestones at the appropriate age. He regularly had green stools.

4. Diagnosis

According to contemporary science, the pathogenesis of FCS shows vitiation of *Kapha* and *Pitta dosha* (fundamental units of physiologic regulation) and *Rasa dhatu* (the primary product of digested food). After considering the r*asakrita* cause and *guru* (heavy) and *snigdh* (unctuous) after delivery diet, the initial diagnosis was *amajeerna* (*kapha dosha* dominant indigestion) due to *atisnigdh dugdhpan* (excessively unctuous breast milk) [5]. After two months of the initial treatment, the patient was treated for *Kapha Pitta dushti* (abnormality) in *Rasa* and *Raktavah*

Table 2
Details of the Ayurvedic treatment given to a case of Congenital Hyperlipidemia.

Medicine	Daily dose	Qualities	Action	Use in this case	Duration of treatment and age
Guduchi [*Tinospora cordifolia*]	250 mg Twice	*Laghu* (clears channels), *Rasayana* (rejuvenating)	*Deepana* (digestion stimulating), *shleshma shonit vibandh* (anti-coagulant) [6]	*Tridoshghna* (reduces *vata, pitta, kapha* humors), *kaphahar* (eliminating), *rasayana*	For 3years Six months to 3.6 yrs
Musta [Cyprus rotundus]	250 mg Twice	*Laghu, Ruksha* (reducing moisture)	*Deepan, Pachan* (enhances metabolic transformation) [6,7]	*Rasa, Rakta dhatwagni vardhan* (stimulating *rasa* and *rakta* tissue metabolism)	For 3years Six months to 3.6 yrs
Usheera [Vettiveria zizanioides]	250 mg Twice	*Laghu Ruksha*	*Deepan, Pachan, Chhardi* (anti-emetic) [6]	*Chhardi nashak, Hridya* (beneficial for cardiovascular health)	For 3years Six months to 3.6 yrs
Bilva [*Aegle marmelos*]	250 mg Twice a day	*Laghu, Ruksha*	*Deepan, Vaat Kaphahar* [6]	Liver stimulant [8]	For 2.6 yrs 1yr to 3.6 yrs
Daru haridra [*Berberis aristata*]	250 mg Twice a day	*Laghu, Ruksha*	*Ushna veerya* (hot potency), *Kapha and Pitta har*	*Kaphahar, Netral* (beneficial for eyes) *Rasayana* [9]	For 3years Six months to 3.6 yrs
Triphala	250 mg Twice a day		*Kapha Pittahar, Meha* (prediabetic syndrome) *and Shotha nashak* (anti-inflammetory) [7,10]	*Rasayana, Kledahar* (reducing body fluids)	For 3years Six months to 3.6 yrs
[a]Arogya Vardhini	60 mg Twice a day	*Lekhya* (scarifying)	*Deepan, Pachan, Hridya* [4]	*Dhatugat Mala shuddhikar* (eliminating tissue waste)	For 2.6 yrs every alternate month 1 yr to 3.6 years
[a]Laghu Soot shekhar	60 mg Twice a day	*Pachak Pitta Niyaman* (regulating)	*Deepan, Pachan, Chhardi* [11]	*Rasa, Rakta dhatwagni vardhan* (stimulating tissue metabolism)	For 12 months 2.6yrs to 3.6 yrs
[a]Sanjivani Gutika	60 mg	*Grahi* (preventing water loss)	*Ajeerna* [12]	*Ampachak* (digestive)	Intermittently used after 3 yrs of age.

[a] Manufacturer: Bagewadikar Ayurved Rasshala Company, Solapur.

Table 3
After treatment blood reports of a Hyperlipidemia case.

Date	Age	CH	TG	LDL	HDL
Reference Range**	**1-3yrs**	**37–178 mg/dl**	**25–119 mg/dl**	**Below 100 mg/dl**	**12–60 mg/dl**
23/04/2010 1st Day of visit	6mth				
04/12/2010	1.2yrs	120.87	2913.8	84.11	15.82
16/06/2011	1.6yrs	89.08	1686.94	40.16	19
Reference Range*		**130–200 mg%**	**30–150 mg%**	**50–130 mg%**	**35–80 mg%**
28/01/2012	2yrs	150.3	1298	−145.5	36.2
11/05/2013	3.6yrs	211	1986	NA	33

CH: Cholesterol, TG: Triglycerides, LDL: Low-density lipoproteins, HDL: High-density lipoproteins. * Adult Treatment Panel III Recommendation by NCEP, ** RXL System Pediatric reference range.

srotas (deformity of the *Kapha Pitta* humors in the tissue nourishment pathway of the first and the second tissue respectively).

5. Therapeutic intervention

10 ml of fresh decoction of *Guduchi* (Tinospora Cordifolia), *Musta* (*Cyperus rotundus* Linn.), *Daruharidra* (Berberis aristate D. C.), *Usheera* (Vetiveria zizaniodes) *and Triphala* (mixture of Emblica officinalis Gaertn., *Terminalia chebula* Retz., Terminalia belerica Roxb.) was given twice a day for first two months. It was prepared by boiling the 1 gm mixture of the above powders and 80 ml of water until reduced to 10 ml. For convenience, the same preparation was given in powder form with honey after two months. The green color of the stool started diminishing within few days after the administration of *Arogyavardhini vati. Sanjivani Vati, Laghoo Sootshekar vati, Bilwa* leaf powder (Egle Marmelous) were the symptomatic medicines given within the three years of treatment [Table 2]. After the intervention, episodes of acute abdominal colic were observed seldomly. Stool color examination played an essential role in the early months to check digestion (see Table 3).

The mother was unwilling for any medication; hence diet restrictions have been advised.

Diet: Easy-to-digest, home-cooked warm food ad libitum has been suggested for the child to avoid *ajeerana* (indigestion). Instead of a strict diet, a small quantity of homemade ghee, sugar, and jaggery was prescribed after the child started walking (after one year of age). The mother was advised to avoid oily, improperly cooked, stale foods and sweets till she was breasfeeding.

Follow up

6. Treatment outcome

According to the clinical practice guidelines of the Endocrine Society, maintaining S. Triglycerides under 2000 mg% avoids the risk of pancreatitis and abdominal colic [1]. Which was achieved by this treatment. Episodes of acute abdominal colic remarkably reduced.

Investigations done after regular medication of 3 years [Table 1] showed normal S. Cholesterol, HDL, S. Amylase, G6PD, Thyroid, Kidney functions, and Liver functions. Borderline random blood sugar 156.1 mg% once noted. Hence, all the medicines used in this case can be considered safe for young children.

The child was under the supervision of the same pediatrician throughout the treatment, and he carried out all the clinical investigations. As told by the parents, the pediatrician never gave any treatment for hyperlipidemia throughout the treatment period.

7. Discussion

Medodushti (deformity of fat tissue) is one of the leading causes of secondary hyperlipidemia. However, in very young children, the pathogenesis of hyperlipidemia relates to the vitiation of *Kapha dosha* and *Rasa dhatu* (the first tissue). Though bed rest and protein supplements were necessary in this case, they can be associated with the *Rasakrita vyadhi* (congenital disease due to dietary indiscretions of a mother during pregnancy) [13,14].

Agnivardhan (stimulation of digestive and metabolic process) was the first aim of the treatment. Hence, the patient was treated with *deepaniya* (improves metabolic digestion), *pachaneeya* (enhances metabolic transformation), and *lekhaneeya* (scarifying) medicines. *Arogyavardhini* was given every alternate month because of its *lekhaneeya* (scarifying) property. The hypolipidemic action of *Musta*, *Daruharidra*, *Triphala*, and *Arogyavardhini* has been proved to be safe in adults [4,6–8]. As the primary seat of *rasa* is *hridaya* (heart), medicines like *Arogyavardhini* and *Laghoo Sootshekhar* comprised hridya properties (beneficial for cardiovascular health) were included. Medicines with *rasayana* (rejuvenating) properties, like *Triphala* and *Guduchi*, were included for the prolonged treatment. Fewer episodes of abdominal colic resulted in diet laxity, which may be the reason for increased Serum cholesterol levels.

The parents were each other's first cousins, which may be the probable reason along with the inability to afford the examination expense for not opting for the genetic study [15].

8. Conclusion

Clinical outcomes of this case indicate that in congenital hyperlipidemia, maintaining S. Triglycerides below 2000 mg% can be achieved by Ayurvedic interventions. Treatment as per Ayurvedic principles can reduce complications and improve the quality of life.

Conflict of interest

None.

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Author contributions

Conceptualization, resources, writing original draft, and writing-review and editing done by Author herself.

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