

## Case Report

# Transient hyperphosphatasemia in children

Rolan Bassrawi, Narjes Alsabie , Deema Alsorani, Amir Babiker

Department of Pediatrics, College of Medicine and King Khalid University Hospital, King Saud University, Riyadh, Saudi Arabia

## ABSTRACT

Transient Hyperphosphatasemia (TH) is a benign condition in which serum alkaline phosphatase (ALP) is transiently elevated in the absence of other systemic diseases. It mainly occurs in infants and children and very rarely seen in adults. The differential diagnosis may include liver, bone, kidney, intestinal, placental and blood diseases as well as other serious conditions as well as bone fracture due to accidental or non-accidental injuries. In this report, we present two of our patients with TH and compare their clinical course with the natural history of TH described in literature. We also provide a focused review, in relevance to our presented cases, of this disease, which is rarely encountered in clinical practice.

### Key words:

Alkaline phosphatase, Hyperphosphatasemia, hyperphosphatasia, Transient, Saudi Arabia

## INTRODUCTION

Transient Hyperphosphatasemia (TH) is a benign condition characterized by marked elevation of serum alkaline phosphatase (ALP) with absence of other associated disease such as in liver, bone or kidneys. In addition TH is also characterized by a return of ALP to normal levels within weeks or months of initial observation.

The exclusion of such causative illness before establishing a diagnosis of TH is of a paramount importance. As elsewhere, TH is generally rare to see in children managed in the inpatient and outpatient clinics at KCUH, Riyadh, Saudi Arabia. Yet the awareness of this condition, which is rarely encountered in practice, is important for both patients/parents and clinicians. This will encourage the avoidance of unnecessary concerns and investigations. We report on two patients with TH to highlight the classic presentation as well as the natural history of the disease with a focused review of literature on the subject.

### Correspondence to:

Dr Amir Babiker

Department of Pediatrics (39)

College of Medicine and KCUH

P.O Box 2925, Riyadh 11461, Saudi Arabia

Telephone: +966 537806560, Fax: +966 114679463

Email: amibabiker@ksu.edu.sa

babikeramir@hotmail.com

### How to cite this article:

Bassrawi R, Alsabie N, Alsorani D, Babiker A.

Transient Hyperphosphatasemia in children. Sudan J Paediatr 2014;14(2):85 - 88.

## CASE REPORTS

### Case 1

A 1-year- and 3- month -old girl was followed in clinic as a case of eczema and failure to gain weight. She was otherwise healthy with normal development. She fed on fortified milk formula, regular diet and she was on treatment for topical eczema. On examination, her weight was on 5-10 centile with unremarkable systemic exam suggesting organic disease or physical abuse. Her initial screening blood work at 1yr of

age was within normal including bone profile. At 1yr and 3 month of age accidentally found to have a serum alkaline phosphates (ALP) level of 3595U/L, which had further increased to 7273U/L after 2 weeks (normal lab value 175-476U/L). All her other investigation was normal (Table1). When followed in clinic, the ALP level started to drop dramatically from 7273U/L to 654,304,258U/L on monthly bases until normalized. It remained normal until her preschool vaccine visit when last reviewed (271U/L), and the patient appeared healthy.

**Table 1 – Investigations of case 1 at presentation and during follow up**

Investigations	At presentation	After 1 month	After 2 months	After 3 months
ALP (N=175-476 u/l)	7273	654	304	258
25(OH) VIT D (N=23-113 nmol/l)	-	152	-	-
PTH (N=1.65-6.9 pmol/l)	2.69	-	-	-
Corrected Ca (N=2.25-2.75 mmol/l)	2.5	2.5	2.48	2.4
Phosphorus (N=1.45-2.16 nmol/l)	1.82	1.98	1.96	2
ALT (N=10-31 u/l)	46	-	25	-
Urea (N=1.8-6.4 mmol/l)	3.3	-	3.2	-
Serum creatinine (N=27-62 umol/l)	16	-	33	-
Radiology: Wrist X-ray	-	Normal	-	-

### CASE 2

Was a 7-month-old healthy girl, on milk formula feeds, thriving well and developmentally normal with no social concerns. She presented to the children outpatient clinic at KKHU, SA with constipation and

overflow diarrhea for which she was investigated. Her physical examination was normal. Initial blood work was normal (table2), a part from a high ALP (3423U/L, N= 175-476U/L), which dropped spontaneously to 411U/L after 1 month.

**Table 2 - Investigations of case 2 at presentation and during follow up**

Investigations	At presentation	After 1 month
<b>ALP</b> (N=175-476 u/l)	3423	411
<b>25(OH) VIT D</b> (N=23-113 nmol/l)	130	-
<b>Corrected Ca</b> (N=2.25-2.75 mmol/l)	2.5	2.5
<b>Phosphorus</b> (N=1.45-2.16 nmol/l)	2.14	1.94
<b>ALT</b> (N=10-31 u/l)	39	37
<b>Urea</b> (N=1.8-6.4 mmol/l)	24	-
<b>Serum creatinine</b> (N=27-62 umol/l)	22	-
<b>Radiology:</b> <b>Wrist X-ray</b>	Normal	-

## DISCUSSION

Transient Hyperphosphatasemia (TH) of infancy and early childhood is defined as a marked elevation of the serum Alkaline Phosphatase (ALP) activity in children younger than five year of age in the absence of clinical or laboratory findings of a systemic disease that may lead to similar biochemical picture [1]. ALP represents a group of isoenzymes originating mainly from kidney, bone, liver, placenta intestine and white blood cells [2]. The ALP level changes with age, it is generally higher in children than in adults, with a peak in the first six months of age and during pubertal growth spurt, because they have higher osteoblastic activity in this age [3,4]. In TH, as in our patients, the serum level of ALP is typically elevated four to five times above the upper limit of normal and gradually returns to normal within six months [5,6].

Although TH has been well known for decades its etiology and pathophysiology remain unclear. It is

considered as a benign condition in children and has also rarely been reported in adults [7]. The prevalence of TH is not known in Saudi Arabia or worldwide. In a series of 260 healthy infants, 1.5% (n=3) had unexplained and transient elevations in ALP, all of them had more than three times the upper limit of the normal range [8]. Most children with TH are healthy although TH can be incidentally identified in association with a variety of clinical conditions including gastroenteritis, respiratory infections, failure to thrive, chronic otitis media and asthma [9]. Case 1 in our report was assessed because of failure to thrive and case 2 presented with chronic constipation. This clearly highlights the difficulty in differentiating benign TH from an ongoing serious condition such as concomitant physical abuse and neglect and warrants a careful attention to family and social history. Follow up is required to document the return of serum ALP level to normal and it is critical for confirmation

of the diagnosis. The sustained elevation of ALP beyond three to four month of initially being high should prompt reconsideration of other causes of Hyperphosphatasia [10]. However, children with TH should be spared from extensive investigations and unnecessary vitamin D treatment attempts. An initial thorough assessment including detailed social history, with infrequent biochemical follow up of ALP is the whole mark of diagnosing this condition and avoiding

missing other pathology.

---

## CONCLUSION

Though no accurate estimation of its prevalence worldwide, transient Hyperphosphatasemia (TH) seems to be rarely encountered in our community, as elsewhere in the world. Our two reported cases demonstrated a classic natural history of the disease with regards to presentation and recovery.

---

## REFERENCES

1. Wolf PL. The significance of transient hyperphosphatasemia of infancy and childhood to the clinician and clinical pathologist. *Arch Pathol LabMed* 1995; 119:774-5.
2. Moss DW. Alkaline phosphatase isoenzymes. *Clin Chem* 1982; 28:2007-16.
3. Stein P, Rosalki SB, Foo AY, Hjelm M. Transient hyperphosphatesemia of infancy and early childhood: clinical and biochemical features of 21 cases and literature review. *Clin Chem* 1987; 33:313-8.
4. Turan S, Topcu B, Gökçe I, Güran T, Atay Z, Omar A, et al. Serum Alkaline Phosphatase Levels in Healthy Children and Evaluation of Alkaline Phosphatase-z-scores in Different Types of Rickets. *J Clin Res Pediatr Endocrinol*. Mar 2011; 3(1): 7–11. doi: 10.4274/jcrpe.v3i1.02
5. Behulova D, Bzduch V, Holesova D, et al. Transient Hyperphosphatasemia of infancy and childhood: study of 194 cases. *Clin Chem* 2000; 46:1868-9.
6. Carroll AJ, Coakley JC. Transient hyperphosphatesemia: an important condition to recognize. *J Paediatric Child Health* 2001; 37:359-362.
7. Schambeck CM, Kopp A, Mora-Maza G, Keller F. Transient hyperphosphatesemia in infancy and adult: Biochemical Peculiarities. *Eur J Clin Chem Clin Biochem* 1997; 35:441-4.
8. Asanti R, Hultin H, Visakorpi JK. Serum alkaline phosphatase in healthy infants. Occurance of abnormally high values without known cause. *Ann Paediatr Fenn*. 1966;12:139-42.
9. Dori N, Levi, Stam T, Sukhotnik I, Shaoul R. Transient hyperphosphatesemia in children revisited. *Pediatric International* 2010; 52:866-871.
10. Tolaymat N, deMelo MC. Benign Transient hyperphosphatesemia of infancy and childhood. *South Med J* 2000; 93:1162-4.