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Prevalence of hypocalcemia among thalassemic patients registered in ibn al-balady hospital

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Abstract

The objective of this study is to through light on the prevalence of hypocalcaemia in thalassemic patients registered in Ibn Al-balady Hospital (Thalassemic Centre) Baghdad-Iraq four hundred patients selected with thalassemia major were included in the study, randomly selected throughout October, 2001. They are subjected to serum study for calcium phosphorus and alkaline phosphatase. Twenty patients x-rayed for bones only no facilities for studying serum ferritin, parathyroid hormone and densometry for bones. It was found that hypocalcaemia is prevalent in eighty seven patients out of 400 and more prevalent among age group 10 years and above

انتشار نقص الكالسيوم بين المرضى المصابين بمرض الثلاسيميا في مستشفى ابن البلدي

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المستخلص

إنّ الهدفَ من هذه الدراسةِ هو دراسة إنتشار نقص الكالسيوم في مرضى الثلاسيميا حيث سجّلتْ هذه الدراسه مستشفى إبن البلدي (مركز الثلاسيميا) – بغداد- العراق. تُضمنتْ هذه الدراسةِ اختيار أربعمائة مريض يعانون من الثلاسيما الرئيسيه ، تم اختيارها بشكل عشوائي طوال الاشهر أكتوبر و تشرين الأول لعام ٢٠٠١ . هذه العينه العشوائيه تم اخضاعها إلى دراسةِ عناصر الفسفور ، الكالسيوم وانزيم الفوسفتيز القلوي في مصل الدم. حيث وجد ان انخفاض مستوى الكالسيوم سائدٌ في سبعة وثمانون مريض من المجموع الكلي والذي هو اربعمائة مريض وأكثر سيادة بين المجاميع العُمرية ذات العشر سنوات فما فوق.

Introduction

Hypocalcaemia is well known complication of iron overloaded and/or anemia Iron overload occurs when iron intake is increased over a sustained period of time either from the transfusion of red blood cells or because there is increased absorption of iron from the digestive tract, both of these occur in thalassemia [6, 7]. Blood transfusion being the major cause in thalassemia major and increased iron absorption being more important in thalassemia intermedia [9, 10]. Because there is no mechanism in human to excrete the excess iron, this has to be removed by chelation therapy. Transfusion iron overload in thalassemia major is fatal in the second decade of life usually from cardiac complications iron overload also causes pituitary damage with hypogonadism and poor growth Endocrine complications namely diabetes, hypothyroism and hypoparathyroism also seen [1, 12]. Liver diseases with fibrosis and eventually cirrhosis particularly if a concomitant chronic hepatitis is present. Majority of hypocalcaemia patients due to iron overload show mild form of the disease accompanied by paraesthesia more sever cases may demonstrate tetany, seizures or cardiac failure [5, 8]. Hypocalcaemia is defined as total serum calcium <7.5mg/dl (1.75mmol/l) or Ionized calcium <3.5mg/dl.however mild symptoms can occur with a total, calcium of 7.5mg/dl in neonate and 8.5mg/dl in older children [2, 3, 4]. Most of the calcium is in skeleton, the plasma calcium, normally about 10mg/dl (meq/L, 2.5mmol/l) is partly bound to protein and partly diffusible [7, 8]. Three hormones are primarily concerned with regulation of calcium metabolism. 1, 25-Dihyroxycholecalciferol is steroid hormone formed from vitamin D by successive hydroxylations in the liver and kidney. It increases calcium absorption from the intestine and bone. Parathyroid hormone which is secreted by the parathyroid glands mobilizes calcium from bone and increases urinary phosphate excretion [11]. Calcitonin a calcium lowering hormone secreted by the thyroid gland,inhibits bone resorption. All three hormones operate in concert to maintain the constancy of the calcium

Table I: Distribution (mmol/L) of calcium in normal human plasma

Diffusible	1.34
Ionized(calcium)	1.18
Complexed to HCO3 citrate	0.16
Non diffusible(protein bound)	1.16
Bound to albumin	0.22
Bound to Globulin	0.24
Total Plasma Calcium	2.5

Aim: The purpose of this study is to estimate the prevalence of hypocalcemia among thalassemic patients in Ibn Al-balady Hospital (thalassemic centre).

Patients and Methods

Four hundred patients with thalassemia major registered in Ibn Al-Balady Hospital (thalassemic centre) In Baghdad Iraq throughout October 2001 were selected randomly for this study. After a full clinical examination all the patients were level in the body fluids [12]
subjected to serum study for calcium, phosphorus and alkaline phosphatase. Bone x-ray were done only for twenty patients. Facilities for studying serum ferritin, parathyroid hormone and bone density (densometry) not available at that time.

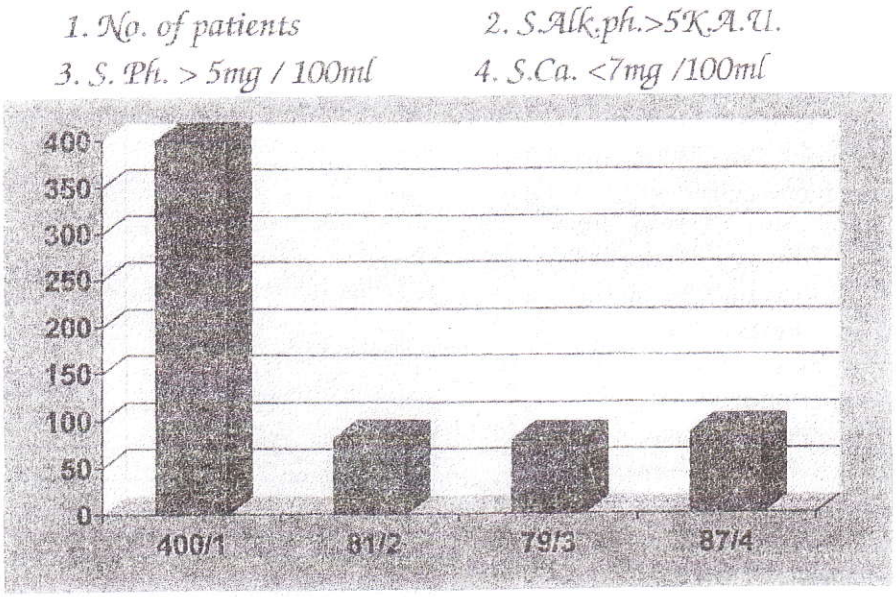

Figure (1): Shows the age distribution of the patients with hypocalcaemia included in this study

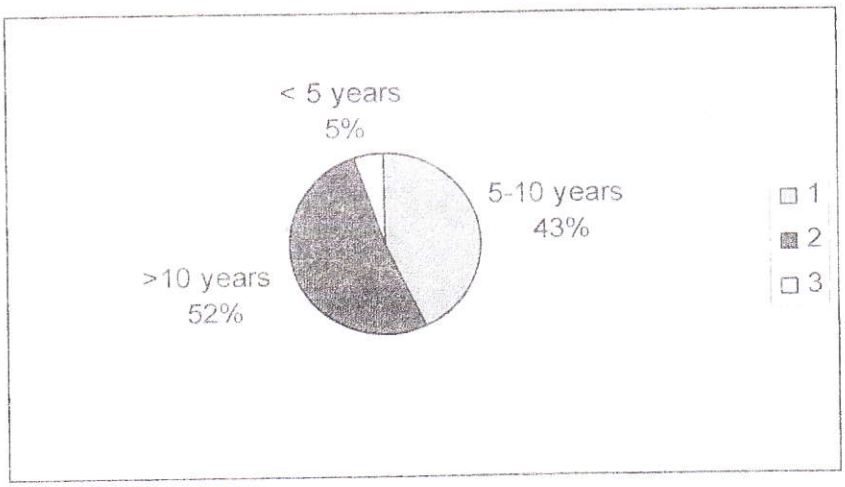

Figure (2): Shows the age distribution of the patients with hypocalcaemia included in this study

Results

All the results obtained from 400 thalassaemic patients are tabulated. Figure I shows that among the 400 patients included in this study, 87 (21.75%) detected with all serum calcium less than 7.5mg/dl (mmol/l). Fifty five patients (63%) with carpopedal spasm, twenty patients (22.9%) with irritability, sever headache, calf, muscle spas and paraesthesia, ten patients (11.4%) with latent tetany are patient with seizure and one patient with combined findings. Eighty one patients with serum alkaline phosphatase above 5k.a. u. 79 patients with serum phosphorus above 5mg/dl. Figure II shows the age distribution of the patients with hypocalcaemia included in this study 52% above 10 years of age. 43% from 5-10 years. 5% less than 5 years. Figure II shows that: among the 400 patients included in this study 87 (21.75%) detected with total serum calcium less than 7.5mg/dl (mmol/l). figure II shows the age distribution of the patients with hypocalcaemia included in this study: 52% above 10 years of age. 43% from5-10 years. 5% less than 5 years.

Discussion

It's clearly show that hypocalcaemia is so prevalent in thalassemia major higher prevalence rate was among age groups of 10 years and above. This finding correlated with the previous study by (Desantis, 1995) which showed that hypocalcaemia due to hypoparathyroidism [1, 2], in thalassaemia and it is recognized later complication (age 16 years and above). However in the study demonstrated hypocalcaemia earlier than that detected by (Desanctis1995) this attributed to:

1-Delay in diagnosis of thalassaemia in our society with subsequent delay in the treatment which leads to early and severs complication.

2-Poor patient compliance due to poor education about the disease

3-Therapy for thalassaemia is not always available.

4-Communications between the thalassaemic centers and the patients are not always easy.

It is difficult now and at the time of the study to differentiate between the different causes of hypocalcaemia due to lack of facilities as mentioned above. This is a preliminary study and a further study is needed to know the causes later.

Conclusion

It is ultimately concluded that hypocalcaemia is prevalent in thalassaemc patients and more prevalent in age group 10 years and above.

Recommendations

1. Screening tests are very essential serum calcium and phosphorus must be done for the thalassaemic patients periodically especially for age group 10 years and above.
2. Best results were found with intensive deferral therapy and a vitamin D (one alpha) along with calcium rich diet oral administration of vitamin D or one of its analogous. Some patients require high doses of vitamin D to normalize their serum calcium levels. This should be carefully monitored as hypocalcaemia is a common complication of this treatment tetany and cardiac failure due to sever hypocalcaemia require intravenous administration of calcium under careful cardiac monitoring followed by oral vitamin D.
3. More governmental support is required focusing on availability of therapy , facilities for discovering the cases. On the top of all education about the Thalassaemia is very important
4. Screening for thalassaemia must be included with other tests as premarriage requirements Social supports for the patients and their families including psychological support.

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