Assessment of The Therapeutic Effect of Calcium and Vitamin D on Vitamin D Level and Bone mineral Density in children with Chronic Liver Disease

Thesis
Submitted for partial fulfillment of master degree of pediatrics
By

Marwa Bsyouni Younis
M.B.B.ch
Under supervision of

Prof. Dr. Zeinab Anwar Al-Kabbany
Professor of Pediatrics
Faculty of medicine
Ain Shams University

Dr. Reham Mohammed Al-Husseiny AbdelBasir
Lecturer of Pediatrics
Faculty of medicine
Ain Shams University

Dr. Amira Ibrahim Hamed
Lecturer of Clinical Pathology
Faculty of medicine
Ain Shams University

Faculty of medicine
Ain Shams University
2011

دراسة التأثير العلاجي للكالسيوم وفيتامين د علي مستوى فيتامين د وعلى كثافة العظام في الأطفال الذين يعانون من أمراض الكبد المزمنة

توطئة للحصول على درجة الماجستير في طب الأطفال

مقدمة من الطبيب

مروة بسيونى يونس محمد
بكالوريوس الطب و الجراحة

تحت إشراف

ا.د/ زينب أنور القباني
أستاذ طب الأطفال
كلية الطب جامعة عين شمس

د/ ريهام محمد الحسيني عبد البصير
مدرس طب الأطفال
كلية الطب جامعة عين شمس

د/ أميرة ابراهيم حامد
مدرس الباتولجيا الاكلينكية
كلية الطب جامعة عين شمس

كلية الطب
جامعة عين شمس
٢٠١١

SUMMARY AND CONCLUSION

Chronic liver diseases are the continuity of clinical or biochemical evidence of hepatic Dysfunction for longer than six months**.**

Metabolic Bone disease is a major complication in patients with chronic liver disease; Osteoprosis accounts for the majority of cases whereas Osteomalacia is rare in the absence of sever advanced liver disease.

Vitamin D deficiency in chronic liver disease is strongly correlated with bone density changes, most guidelines recommend calcium and vitamin D supplementation in patients with chronic liver disease and low bone density

This study was carried out to evaluate the therapeutic effect of Calcium and Vitamin D on bone mineral density in children and adolescents with chronic liver disease and low bone mineral density in the Hepatology Clinic Children's Hospital– Ain Shams University

The study included the following:

- **Patients:** 18 patients of children and adolescents following up at the Pediatric Hepatology Clinic Children's Hospital - Ain Shams University in the period from April 2008 to June 2009 they comprised 13 females and 5 males,

ACKNOWLEDGMENT

My deepest gratitude and thanks to God the most merciful for giving me the strength to complete this work

I wish to express my sincere thanks and gratitude to Professor Dr. Zeinab Anwar Al-Kabbany for her great care, continuous guidance and support and for giving me the chance to work in a field that I like the most.

I would also like to express my great great gratitude to Dr. RehamAl-Husseiny for her valuable advice, guidance and meticulous supervision during every step of this work.

I would also like to thank Dr. Amira Ibrahimfor her help and his valuable work in this thesis.

My deepest thanks and gratitude to my family for their great support sacrifice and help.

I would also like to thank all the patients for their cooperation to complete this work.

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INTRODUCTION

Chronic liver disease is defined as cirrhosis (clinically suspected or histologically proved) or the presence of severe cholestatic liver disease (serum bilirubin level more than three times the upper limit of normal for more than six months). ***(Collier et al.; 2002)***

Metabolic bone disease is common among patients with chronic liver disease.Osteoprosis accounts for the majority of cases whereas Osteomalacia is rare in the absence of severe advanced liver disease. ***(Rouillard and Lane; 2001)***

Metabolic bone disease occurring in individuals with chronic liver disease, known as hepatic osteodystrophy, is a potentialcomplication of long standing hepatic disease. ***(American Gasterological Association; 2003)***

Osteoporosis and osteoporotic fractures occur commonly in patients with chronic liver disease, the prevalence of Osteoprosis and osteoporotic fract ures has been reportred to vary between 37-53% and 4-21% respectively.

The pathogenetic mechanism of hepatic Osteodystrophy is complex and may be due to defective osteoplastic bone formation, increased osteoclastic bone resorption, or both. ***(Maalouf et al.; 2006)***

Osteoporosis is a histologic diagnosis; however, clinical recognition relies on non invasive imaging studies such as bone mineral density measurements and radiography, which enable an assessment of bone mass and fracture risk. The World Health Organization defines osteoporosis as bone mineral density 2.5 standard deviations below the youngnormal mean by (T score).***(Rouillard and Lane; 2001)***

Vitamin D deficiency in chronic liver disease is strongly correlated with bone density changes. Most guidelines recommend calcium and vitamin D supplementation in patients with chronicliver disease and low bone density**.** ***(Bronwyn et al.; 2006)***

Calcium , an essential component of bone mineral, given in 1000 -1500 mg daily in divided doses(two to three times daily) has a role in treatment as it suppresses parathyroid hormone thus lowering bone resorption**,** Vitamin D in a dose of 400 -800 IU Daily increasing fractional intestinal calciumabsorption. ***(Maalouf et al.; 2006)***

Aim Of the work

The aim of this study was to evaluate the therapeutic effect of Calcium and Vitamin D on the level of vitamin D and bone mineral density in children and adolescents with chronic liver disease.

Chapter1

Chronic Liver Disease in Children

Chronic Hepatitis

Chronic hepatitis is defined as ongoing inflammation within the liver that is capable of progression to cirrhosis, liver failure, and death.Also is defined as the presence of continued hepatic inflammation, as confirmed by clinical manifestations and laboratory studies, for a period of greater than 10 weeks ***(Suchy, 1996).***

Two major categories of chronic hepatitis are recognized-chronic persistent (CPH) and chronic active hepatitis (CAH)-based on multiple factors which are hepatocellular necrosis, apoptosis and inflammation and the location of the inflammatory lesion found in histological specimens ***(Sherlock, 1997).***

- **Causes of chronic liver disease *(suchy, 2001).***

➢ **<u>Metabolic Disorders</u>**

- **<u>Carbohydrate metabolism</u>**
  - Glycogen storage disease
  - Fructosemia
  - Galactosemia

- **Lipid metabolism**
  - Gaucher's disease
  - Niemann–Pick disease,type D
  - Wolman's disease
- **Protein metabolism**
  - Tyrosinemia
  - Cystinosis
- **Mineral metabolism**
  - Hemochromatosis
  - Wilson's disease
  - Infantile copper overload
- **Biliary Malformations**
  - Primary sclerosing cholangitis
  - Biliary atresia
  - Primary biliary cirrhosis
  - Arteriohepatic dysplasia
  - (Alagille syndrome)
  - ntrahepatic biliary hypoplasia
  - Choledochal cyst
  - Congenital hepatic fibrosis
  - Intrahepatic cystic biliary
  - (Caroli's disease)
  - Familial intrahepatic cholestasis(Byler's disease)

- **Infectious diseases**
  - **Viral**
    - Chronic hepatitis B+/− delta
    - Chronic hepatitis C
    - Cytomegalovirus agents
    - Herpes simplex virus
    - Rubella
  - **Bacterial**
    - Syphilis
    - TB
  - **Parasitic**
    - Shistosomiasis
    - Liver flukes.

- **Genetic disorder**
  - α1-antitrypsin deficiency
  - Cystic fibrosis

- **Vascular**
  - Vascular lesions
  - Budd–Chiari syndrome
  - Congestive heart failure
  - Congestive pericarditis
  - Veno-occlusive liver disease
  - Venacaval web ***(suchy, 2001).***