

Patterns of nail changes in chronic liver diseases

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Abstract

Background: Nail abnormalities were frequently associated with liver diseases. Early detection of these nail changes may help to initiate early treatment and reduce serious complications, sequelae, morbidity and mortality of chronic liver diseases.

Objective: To record the frequency and patterns of nail changes in patients with chronic liver diseases.

Patients and methods: The study included 1000 patients attended the Tropical Medicine and Gastroenterology department in Sohag University Hospital, between October 2017 and October 2018 with clinical and/ or laboratory diagnosis of liver diseases. Full nail examination was performed.

Results: In this study, nail changes are found in the majority of patients with liver diseases (80.5%). White nails were the commonest abnormality noted followed by longitudinal striations, Terry's nails, brittle nails, clubbing, flat nails and onychomycosis.

Conclusion: Nail abnormalities are common with liver cirrhosis as well as with HCV and HBV infections. The cause of these changes remains unknown; it may be as a consequence of decreased cell-mediated immunity, immunosuppression, iron deficiency, anaemia or old age, but not that of the virus itself. It is important for the clinicians to understand and examine carefully the nails for colour, texture, thickness and curvature to reach a prompt and early diagnosis of patients with liver disease.

Introduction

Chronic liver disease is defined as the presence of cirrhosis (clinically/radiologically suspected and/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).¹ Dermatologic manifestations are one of the most common extrahepatic manifestations and often provide the first clues of the underlying liver disease.² There are many nail changes associated with chronic liver disease. Finger clubbing is a well-recognised sign of chronic liver disease, especially primary biliary cirrhosis and chronic active hepatitis.³ Terry's nails in which the proximal two-thirds of the nail plate turns powdery white with a ground-glass opacity, may develop in patients with advanced cirrhosis.⁴ So, nails may be the only initial signal of a liver disease. Early detection by

recognizing these nail changes may help to initiate early treatment and reduce serious complications, sequelae, morbidity and mortality of chronic liver diseases.

Aim of the work:

The aim of this work was to study the frequency and patterns of nail changes among patients with liver disease.

Patients and methods:

This study was approved by the Research and Ethical committees at Sohag Faculty of Medicine. The study included 1000 patients attended the Tropical Medicine and Gastroenterology department in Sohag University Hospital, between October 2017 and October 2018, with clinical and/ or laboratory diagnosis of liver diseases. An informed consent was obtained from all participants.

Personal data: included age, gender, marital status, occupation, smoking habit and place of residence.

Medical history: included the duration of liver disease, associated chronic medical disease, past history of any precipitating factors and family history of any liver disease. History also included presence of itchy or non itchy dermatoses. Patients with history of associated endocrinal disorders e.g; diabetes mellitus, thyroid disease or chronic renal illness and those who were receiving treatment with antivirals were excluded from the study.

Patients of the study (who diagnosed as liver cirrhosis) were categorized as compensated and decompensated according to modified Child- Pugh classification of severity of liver disease (**Pugh et al, 1973**) 5. This classification depends on the degree of ascites, the plasma concentrations of bilirubin and albumin, the prothrombin time, and the degree of encephalopathy. According to this classification patients were

divided into: patients with total score 5-6 were considered grade A (well compensated disease), 7-9 grade B (significant functional compromise); and 10-15 grade C (decompensated disease).

Dermatological examination: Nails were examined for changes as regards colour, striations, texture, curvature of nail plates, dystrophy and pigmentation.

Statistical analyses: data were recorded in an excel data sheet and statistical analysis was performed using the statistical package for the social science (SPSS 11.5 for windows). Qualitative variables were presented as frequencies and percentages and were compared using chi-square test. Quantitative variables were presented as mean \pm standard deviation (SD) and were compared using student t-test. Logistic regression analysis was performed to check the potential relationship of cutaneous manifestations in patients with liver diseases and other variables. P value <0.05 was considered significant.

Results

Out of the 1000 patients with liver disease included in this study, 590 (59%) were males and the remaining 410 (41%) were females. The mean (\pm SD) of age of the study population was 45.83 ± 10.51 years.

A) Personal history data:

The majority of patients were above 40 years old (86.29%), farmers (70.50%), residents of rural areas (85.75%), married (81.50%) and were nonsmoker (72.50%).

(B) Medical history data:

In this study, past history of bilharziasis was found in (42.25%), previous operation in (15.5%) and past history of blood transfusion in (3.25%) of patients with liver diseases. Positive family history of liver disease was found in (16.63%) of patients. The majority of patients were diagnosed as liver cirrhosis (68.63%), with duration of liver illness ranging from more than 1 to 5 years (60.13%) and more than half of the cirrhotic patients (53.19%) were compensated.

Comparison of patients with and without nail changes according to diagnosis is shown in table 1.

Patterns of nail changes in patients with liver diseases are shown in table 2.

Parameter	No nail changes		With nail changes		P value
	No. (195)/1000	Percent (19.5%)	No. (805)/1000	Percent (80.5%)	
Diagnosis					
Cirrhosis	38	19.48	508	63.11	<0.0001
Chronic HCV	123	63.07	188	23.35	
Chronic HBV	34	17.44	21	2.61	
Cirrhosis, HCC	0	0.00	16	1.98	

Table (1): Comparison of patients with and without nail changes according to diagnosis, duration and severity of liver disease.

P value < 0.05 means significant

HCV: Hepatitis C virus **HBV:** Hepatitis B virus

HCC: Hepatocellular carcinoma

Parameter	Total no(= 1000)	Percent (%)
Nail changes		
No	195	19.5
White nails	224	22.4
Longitudinal striations	165	16.5
Terry's nails	112	11.2
Brittle nail	112	11.2
Clubbing	110	11
Flat nails	54	5.4
Onychomycosis	28	2.8

Table (2) : Patterns of nail changes in patients with liver diseases.

Discussion

Nail changes are a clue to many systemic diseases. Few articles were concerned with nail changes associated with liver disease. The present clinical observational study highlights the nail changes associated with the most common chronic liver diseases, such as liver cirrhosis, HCV and HBV. In this study, out of the 1000 patients with liver disease included in this study, 590 (59%) were males and the remaining 410 (41%) were females. The mean (\pm SD) of age of the study population was 45.83 ± 10.51 years

In the current study, 67.25% of patients had liver cirrhosis, 28.88% had chronic hepatitis C , 2.5% had chronic hepatitis B and 1.38% HCC on top of cirrhosis. On the other hand, **Zani et al(2011)** who evaluated the epidemiological pattern of chronic liver diseases in Italy, reported chronic hepatitis in 61.6%, followed by cirrhosis (14.0%) and alcoholic liver disease (11.2%) (6). **Choudhury and his colleuges (2018)** reported that the most common cause of chronic liver disease was alcoholic liver disease comprised 62%

of the patients in the study, other causes being cryptogenic liver disease (14%), chronic hepatitis infection (12%), Wilson's disease (2%), autoimmune hepatitis (2%), hepatocellular carcinoma (2%), methotrexate induced liver disease (1%) and non-alcoholic steatohepatitis (1%) (7). **Sayal et al(1997) and Yoon et al (2006)** also showed alcohol to be the commonest cause for liver cirrhosis (8,9). In Egypt, many comorbid factors may lead to alteration of the natural history of HCV, thus leading to more inflammation and a higher rate of progression of liver disease. These factors include schistosomiasis, hepatitis B infection, fatty liver disease, recurrent exposure to environmental toxins and pesticides. Most of these factors along with cirrhosis increase the risk of HCC (**El Zayadi et al, 2008**) (10).

In this study, the majority of patients with liver diseases (80.5%) showed nail changes. This result was higher than that reported by **Salem and his colleagues (2010)** from Zagazig, Egypt who recorded nail changes in 68% of patients with liver diseases (11). **Jai et al (2013)** who reported nail

changes in 72%(12). **Choudhury and his colleuges (2018)** found nail changes in 60% of patients with chronic liver diseases (7).

In this study, white nails were the commonest abnormality noted followed by longitudinal striations, terry's nails, brittle nails, clubbing, flat nails and onychomycosis. **Salem and his colleagues (2010)** from Egypt reported that the nail infection, onychomycosis, was the most common finding followed by in a descending order, longitudinal striations, brittle nails, onychorrhexis, clubbing of fingers, dystrophic nails, leukonychia and longitudinal melanonychia (11). **Godora et al (2017)** from India demonstrated that terry's nails is the most common nail change followed by brittle nails, longitudinal ridging, watch glass deformity, and leukonychia (13). Also, **Choudhury et al (2018)** from India reported that the most common change was Terry's nails, followed by longitudinal ridging, dystrophic nails, Beau's lines, clubbin), brittle nails, onychomycosis, longitudinal melanonychia, Leuconychia, onycholysis, subungual hyperkeratosis. Muehrcke's lines was seen in one patient (7). The exact cause of nail changes in patients with liver diseases remains unknown. It may be as a consequence of decreased cell-mediated immunity, immunosuppression, iron deficiency, anaemia or old age (11).

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