



VARIATIONS IN LIVER PARAMETERS IN BURN VICTIMS CHU-MOHAMMED VI MARRAKECH

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ABSTRACT This is a retrospective study of 48 cases of severe burns patients followed up at the Plastic Surgery and Burns Department of the Mohammed VI University Hospital Center in Marrakech, with the aim of assessing variations in liver parameters in these patients in the intensive care setting, analyzing the main etiologies. Variations in liver parameters are frequent diagnostic problems in burn patients, possibly resulting from extra-hepatic causes and metabolic disturbances. ALT and ASAT may evolve concomitantly, or be predominant in certain hepatic disorders. The study found that liver function tests were requested easily and frequently in the population studied, but that there was considerable variability in the tests requested and in the management of liver disturbances. Among etiologies, drug-induced is the most suspected, followed by hypermetabolic and hypercatabolic stress reactions. Treatment is adapted according to liver function tests, without systematic recourse to albumin transfusion. This study provides a better understanding of variations in liver parameters in burn patients, and helps guide management to avoid errors in diagnosis and treatment.

KEYWORDS : burn victims, liver function tests, cytolysis.

INTRODUCTION

Variations in liver parameters are a daily diagnostic problem in burn patients. Approximately 1% to 9% of the general population have asymptotically elevated liver tests. In addition, there are extra-hepatic causes of elevated liver tests(1). Today, these tests are easily accessible and their use is increasingly frequent, leading to many chance discoveries of biological anomalies.

The discovery of hepatic disorders in burn patients regularly poses problems in terms of the choice of investigations. There are many possible diagnoses, of varying severity and evolutionary potential, with extra-hepatic causes predominating.

ALT and ASAT generally evolve concomitantly, but in the case of moderate elevations, ALAT may predominate, providing a more specific indicator of liver damage(2).

The etiological assessment of acute cytolysis with a clear elevation in transaminases, above 10 times the norm, is well standardized. On the other hand, a slight disturbance may be indicative of a rare hepatic or metabolic pathology, the diagnosis of which is often more difficult to establish. (3).

In the liver, the main disturbances are metabolic and concern the production of inflammatory proteins.

Hypoalbuminemia is a virtually constant feature of burns. It results from the combined action of several factors: leakage of albumin from the vascular compartment, exudation by burns, increased catabolism and reduced synthesis of albumin. (4).

Our aim was to evaluate the variation in these hepatic parameters in patients with severe burns in the intensive care unit by analyzing the main etiologies.

Patients and Methods

Our study is retrospective on 48 cases spread over 2 years from January 2021 to December 2022.

These 48 cases included patients with severe burns, a frequency of 21% of burn victims, followed up in the plastic and reconstructive surgery

and burns department of the Mohammed VI University Hospital Center in Marrakech.

This study included all patients who had spent time in the plastic surgery and burns intensive care unit, aged 10 years or more.

RESULTS

Sex: The majority of our patients were male (65%), with a sex ratio (M/F) of 1.82.

Age: patients ranged from 15 to 78 years, with a mean age of 34.8 years.

Past history: None of the patients had a history of liver disease. In our series, we found no history of epilepsy in most cases, with 6 cases (12.5%).

Hospitalization time between 0 and 6 hours was the most common at 68%.

The diagnostic delay corresponding to the time elapsed between hospitalization and diagnosis of liver disorder averaged 48 hours. Patients hospitalized after 48 hours or more from the burn had presented with liver disorders in the majority of cases.

Clinical data were poor, and in our context, we did not find any cases of pruritus or hepatomegaly; 2 patients had presented with sub-ictuses after 2 months post-burn.

Liver Function Tests

The tests requested were albumin, transaminases, CRP, total proteins, followed by PT, INR, GGT, PAL and procalcitonin in a few rare cases. 75%, or 36 cases, of patients had mildly elevated transaminases with Asat and AlAt<2N.

Patients on anti-epileptic drugs had moderate transaminase elevations (Alat,Asat>5n).

True electrical burns represented 3 cases, all with a slight increase in ASAT (>3N) above ALAT.

The ASAT/ALAT ratio was less than 1 in all patients with normal

creatinemia.

We Report On 4 Special Cases

Case 1

A 12-year-old patient in a burns intensive care unit on amoxicillin-clavulanic acid for 10 days prior to discharge presented with a severe acute hepatitis with very marked Asat and AlAt>15N associated with subictere 2 months post-burn after discharge.

Case 2

A 42-year-old female patient presented frank jaundice after 3 months post-burn with normal AST and ALT 2N with elevated PAL and GGT under hypercaloric and hyperprotein nutritional protocol during her re-hospitalization. Ultrasound in favor of hepatic steatosis.

Case 3

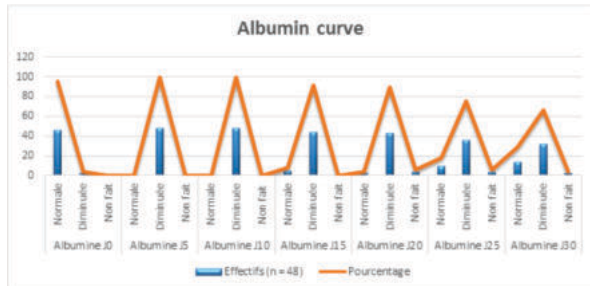
A 32-year-old patient admitted at d7 post-burn on triple antibiotics (Tienam, Vancomycin, colistin) for 27 days. She presented with gastric disturbances (nausea, diarrhoea, vomiting and abdominal discomfort) and abdominal tenderness. Ultrasound revealed significant hepatomegaly on a steatotic liver, associated with a moderately abundant anechogenic peritoneal effusion with a normal hepatic work-up, At d45 post-burn Asat was 2N and AlAt normal, then at d58 Asat 5N and ALAT 2N with PAL, GGT, BT, high BD and low TP, cerebral CT normal. Serologies negative, encephalopathy diagnosis evoked by gastroenterologists. The patient was referred to gastroenterology on discharge.

Case 4

A 14-year-old patient with known epilepsy and no follow-up admitted on d3 post-burn, put on the antiepileptic Lamictal 25mg progressive dose, on d14 on antiepileptic the patient presented with hepatic cytolysis ASAT/ALAT 5N with elevated alkaline phosphatase (ALP) and gamma-glutamyl transferase (GGT), normal ultrasound, serologies negative.

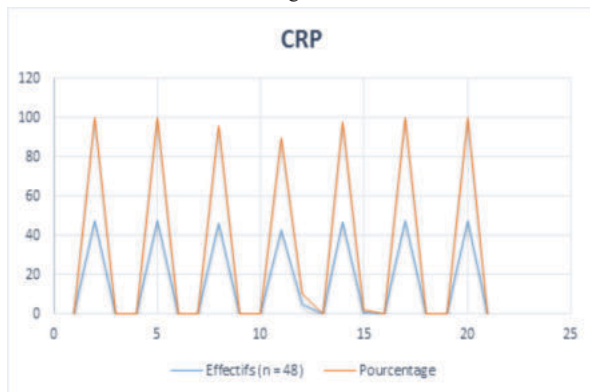
Serologies were requested in 25%, or 12 cases, with negative results. The prothrombin rate (PT) was normal in the majority of patients.

Distribution Of Patients According To Albumin



Albumin and total protein were normal in 95.83% of patients on admission, and were reduced in 100% by 10 days of hospitalization.

Distribution Of Patients According To CRP



C-reactive protein (CRP) was elevated in all patients from the acute phase onwards, and the CRP curve decreased in the secondary phase in the absence of infection.

2 patients showed biological cholestasis, with elevated PAL and GGT.

Drug-induced etiologies were the most suspected, followed by hypermetabolic and hypercatabolic stress reactions.

One case of hepatomegaly was found in these patients.

Treatment

None of the patients was being monitored for liver disease or pathology with hepatic repercussions.

All patients were taking analgesics (paracetamol if pain) and vitamin supplements (vitamin C) and iron.

The 36 cases (75%) had normalized transaminases at the one-week follow-up.

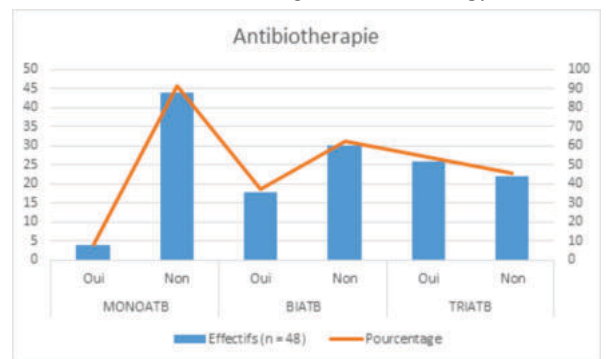
For patients on anti-epileptic drugs, gastroenterologist advice was sought, and the instructions were to stop all hepatotoxic treatments, complete with serologies, abdominal ultrasound and daily monitoring of prothrombin levels. The neurologists' advice was to change the 14-year-old patient's treatment to a non-hepatotoxic antiepileptic, topiramate 75mg, with normalized results after one week of treatment.

The 12-year-old patient was on the same treatment. After a thorough investigation by the gastroenterologist (looking for autoimmunity, celiac disease, Wilson's disease, alpha-1-antitrypsin deficiency, CMV, EBV), the suspected diagnosis was drug-induced, and the patient was put on vitamin 500mg for 2 months, with normalized results after 2 weeks off treatment.

The patient with hepatic encephalopathy died a few weeks after discharge.

Antibiotic therapy was discussed on the basis of bacteriological cultures, infectious work-ups and clinical signs of infection.

Distribution Of Patients According To Antibiotic Therapy



Patients on triple antibiotic therapy were the most represented, at 54%. The average time taken to stop antibiotic therapy was 28 days, with extremes of 10 days and 64 days.

In our context, albumin transfusion was not systematic; it was carried out earlier, depending on liver function tests, more specifically prothrombin and albuminemia, which enabled us to achieve satisfactory results.

DISCUSSION

Epidemiological, clinical and biological studies are few and far between.

Transaminases are two cytosolic enzymes: alanine aminotransferase (ALAT) is mainly of hepatic origin, with muscle and kidney enzymes of secondary importance. Aspartate aminotransferase (ASAT) is much more widely distributed, not only in the liver, but also in the heart, skeletal muscles, kidneys and brain.

The prognostic impact of hypoalbuminemia has been little studied(5). In this study, hypoalbuminemia persisted beyond the 48th hour after thermal trauma, whereas in our study, hypoalbuminemia began between the 2nd and 5th day and persisted in a decreasing manner without correction in burn victims whose burned surface area was greater than 30%.

Among the etiologies of low transaminase elevation, drug-induced hypoalbuminemia was the most suspected, followed by hypermetabolic and hypercatabolic stress reactions.

The hepatic toxicity of paracetamol covers a wide spectrum, from

simple transient elevations in transaminases, asymptomatic in the vast majority of cases, to severe acute hepatic failure (AHF), which is much rarer but can lead to death within a few days in the context of multivisceral failure according to C. Lejealle et al(6) ; We certainly didn't find any similar cases, as our patients were taking paracetamol just in case of pain. According to patient (7) my non-vital medication that may be responsible must be discontinued for the duration of an etiological investigation comparable to our context.

With regard to the investigation of minor disturbances, differences of opinion essentially concern the choice of investigations to be carried out in the first and second line. While some publications encourage a minimal etiological work-up to be carried out straightaway, others suggest remote monitoring to eliminate laboratory errors and transient cytolysis.

If alkaline phosphatase is elevated, a fasting test is recommended, as alkaline phosphatase production can be stimulated by a high-fat meal. A GGT assay is useful to confirm that the elevation is indeed of hepatic origin(1), transaminases were requested, followed by other liver tests: albumin, PT, PAL, total/conjugated bilirubin, CPK.

Bilirubin was requested in 82.6% of cases and normal in all cases in our context comparable to those of Christophe Reynier(France) with 86.7%.(3).

Hemolysis increases transaminases predominantly ASAT According to Knight JA (8), in our context, we haven't found any similar cases.

Muscular pathologies induce a higher increase in ASAT than ALAT according to Clark S et al (9) comparable to electric burns, which represented 3 cases in our context.

CONCLUSION

Variations in liver balance are virtually constant during burns.

It results from the combined action of several factors: leakage of albumin from the vascular compartment, exudation by burns, increased catabolism, reduced synthesis and, in our context, drug-induced origins.

These tests often reveal a slight elevation in transaminases, often cytolysis and disturbances in other hepatic parameters. This situation regularly poses the problem of the choice of investigations, as there are many possible diagnoses, of varying severity and evolutionary potential.

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