

# Microhematuria In Decompensated Cirrhosis

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## Abstract

Hematuria is the presence of blood in urine and microhematuria is defined as three or more red blood cells in a urine sample under microscopic examination. Hematuria is a visible sign of blood in the urine and should be seen by a physician right away. Common causes include renal infections, bladder calculi, renal calculi, urinary tract infections, or bladder or renal cancers. Hematuria can be seen in people of all ages; however, risk of hematuria is increased in older people, especially men.

Microhematuria, however, is something that usually cannot be seen by patients who experience it. It is diagnosed via urine testing. There are four categories of causes of Asymptomatic Microhematuria: Life-Threatening (such as Bladder Cancer), Significant requiring treatment (such as renal calculus or stone), Significant, Requiring Observation (Such as Polycystic Kidney, and Insignificant (Renal Cyst). The prevalence of microhematuria in the general population ranges from .19% to 16.1% and this wide range accounts for differences in age and sex of patients.

Diagnosis of hematuria is done in multiple ways. The first test taken is the urinalysis, which will test the urine for blood and possible infections. Additionally, imaging is taken of the abdomen to see if there is a calculus, cyst, or any abnormal enlargements of the organs in the lower abdomen. Also, a cystoscopy may be performed to diagnose the microhematuria. A cystoscopy is an invasive procedure used to diagnose urinary problems where a cystoscope is inserted in the urethra in order to get an internal view of the bladder. The purpose of this is to visualize the bladder to diagnose any abnormalities. Lastly, a urine cytology can also be ordered to see if there is any infection causing the bleeding. Once all these tests have been ordered and there is still no seen cause for the bleeding, the microhematuria is classified as idiopathic.

In this study, the relation between liver cirrhosis and microhematuria was investigated. In terms of patients with liver failure, microhematuria can be seen due to portal hypertension and bleeding diathesis. Liver failure is a state where the liver is damaged beyond repair and will most likely require a transplant. Some of the most common causes include Hepatitis B, Hepatitis C, alcoholism, and Cirrhosis. Cirrhosis refers to a liver that is scarred. This greatly affects the functions of the liver. If liver tissue is scarred, the bile ducts will inflame and no longer be able to carry out their function. This will lead to jaundice, portal hypertension, and eventually liver failure. Liver failure is accompanied by symptoms such as varices, low platelet counts, and abnormalities in coagulation. These symptoms can lead to the presence of microhematuria.

**Keywords** Hematuria, Liver Transplant, Liver Cirrhosis

## Research Methods

The objective of this study is to determine the incidence of idiopathic microhematuria in the setting of liver failure and see if it is greater than that of the general population. A retrospective review was performed of clinical charts of patients who received liver transplants between January 1, 2003 and December 31, 2003. Data includes recipient demographics, imaging findings, urinalysis results, urology consultations, and hematology parameters at four different visits: pre-transplantation, day of transplant, four month follow up, and most recent date of visit. Patients with high red blood cell counts (>3) are noted and further analyzed.

A list of liver transplant patients at Mayo Clinic Florida was composed. Each of these patients' charts was analyzed. First, the urinalysis and other diagnostics tests mentioned were reviewed to determine if the patient exhibited microhematuria. Then their demographics, including age, gender, and smoking history were determined. Also, MELD score was looked at. The MELD score provides a quantitative measure of the degree of liver failure. The higher the number the more severe the liver failure, and this is used to put patients on transplant lists in hospitals. Lastly, these points were analyzed at four different times in order to follow the red blood cell count as the patient went through the transplant to see if it was resolved post transplant.

## Results

The incidence of hematuria in patients with liver failure was determined to be 25%, this is almost 10% greater than the incidence in the general population. Within this population, the average age was 54 years old. Additionally, 65% of patients were male and 19 out of 37 (51%) had a history of smoking. 9% of these patients were found to have a renal calculus in their abdominal imaging. Their average MELD score before transplant was 19.3 and after was 13.6. Additionally, we found that 75% of patients' microhematuria resolved post-transplant.

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For patients who presented negative for microhematuria, the average age was 55 years old, and 66% were male, and 47% had a history of smoking. The average MELD score for this group was 14.3 before transplant and 11.7 after. The most common cause of the liver failure was Hepatitis C. In patients with microhematuria, 70% was idiopathic and other 30% had complications such as renal stones.

## Conclusion

Out of our 160-person cohort, 40 patients exhibited microhematuria. This is a greater incidence of microhematuria (25%) than expected in the general population (0.19-16.1%). In addition, 75% of patients' microhematuria resolved post transplant. However, 8 out of 40 patients (20%) did not have a urinalysis to compare to post transplant. For the 75% that resolved, their microhematuria was idiopathic and can be attributed to the patient's liver failure. The other 25% had complications ranging from penile surgery to renal calculi.

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