Metabolic Syndrome & Beta Blockers Use is Associated with Portal Vein Thrombosis in NASH Cirrhosis

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Introduction

Portal vein thrombosis (PVT) is associated with increased morbidity of patients with cirrhosis due to worsening portal hypertension, increased surgical complications, and an increased risk of early graft failure.[1]

PVT is associated with non-alcoholic steatohepatitis (NASH).[2] There are several studies that suggest beta blocker use in patients with cirrhosis is associated with PVT development.[3] The mechanism of which is theorized to be secondary to reduction of portal blood flow. There is limited data on the risk of PVT with NASH and concurrent beta blocker use.

Aim: To understand the prevalence of PVT in NASH cirrhosis and understand the risk factors associated with its presence including beta blockers and metabolic syndrome.

Materials & Methods

- A retrospective cohort of patients at a single tertiary liver transplantation center from January 1, 2015 to September 30, 2021
- Inclusion criteria: age greater than 18 years, and diagnosis of NASH or cryptogenic cirrhosis
- Exclusion criteria: non-NASH cirrhosis or PVT secondary to primary coagulopathy
- Metabolic syndrome was defined using International Diabetes Foundation Criteria: A BMI greater than 30 kg/m^2, blood pressure greater than 130/80 mm Hg, triglycerides > 150 mg/dl, HDL < 40 mg/dl for males and 50 mg/dl for females, hemoglobin A1c > 6.5%, or on medical therapy for any of these factors.
- Data was analyzed using SPSS software. The study was approved by the IRB.

Results

- Of the 238 patients, 57 patients had a PVT for a prevalence of 23.9%.
- **Univariate analysis**: hyperlipidemia (p = 0.02), obesity (p = 0.02), metabolic syndrome, and beta blocker use to be associated with portal vein thrombosis
- **Multivariate analysis** presence of metabolic syndrome and BB use were independently associated with portal vein thrombosis
  Metabolic syndrome- (OR: 2.37, CI: 1.21-4.63, p < 0.011)
  Beta blocker (OR:2.14, CI: 1.07-4.29, p < 0.031)

Groups (# of patients)	Number of patients with PVT (57 total)	Prevalence %
No BB, No MS (56)	4	7
BB, No MS (59)	12	20
MS, No BB (44)	15	34
MS, BB (79)	26	33

- The prevalence of PVT was 34% in metabolic syndrome and 20% in beta blocker users
- Metabolic syndrome with concurrent BB use did not seem to confer additional risk of PVT
- Metabolic syndrome presence in NASH cirrhosis
  71.9% of patients with PVT vs 45.9% of patients without PVT (p < 0.01)
- Beta blockers presence in NASH cirrhosis
  67% of patients with PVT vs 53% of patients without PVT (p < 0.02).

Conclusion

1. Presence of metabolic syndrome and use of beta blockers in NASH cirrhosis patients is associated with an increased prevalence of portal vein thrombosis
2. Increased prevalence of PVT in the metabolic syndrome only group suggests that this might be a greater risk factor than BB use
3. Further prospective studies are needed to consider the role of treatment and mitigation of metabolic syndrome associated factors

References

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