Spectral Ultrasound Parameters Could Predict Development of Sinusoidal Obstructive Syndrome in Pediatric Bone Marrow Transplant Patients

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INTRODUCTION

- Sinusoidal obstructive syndrome (SOS) is a complication of hemopoietic stem-cell transplantation (HSCT)
- Clinically diagnosed and has a 15% overall incidence and severe SOS has up to an 80% mortality rate in pediatrics
- Objective: identify differences in spectral Doppler ultrasound (US) parameters between pediatric HSCT patients who developed SOS and those who did not

METHODS

- Single center cohort retrospective study on patients ages 0-21 who underwent HSCT between 09/2001 and 05/2016 (n=280)
- Patients without abdominal US were excluded (n=121)
- Doppler parameters assessed using hierarchical multivariable linear regression models adjusted for number of relapses, HSCT conditioning regimen, disease type
- ROC analysis performed for MPV peak velocity

RESULTS

- 33 patients developed SOS
- Statistically significant differences in the velocities of the main hepatic artery (MHA) and its branches (Figure 1)
- MPV is always different between the two groups (Figure 2)
- MHA EDV was different on 1st US then difference resolved
- MHA PSV was different on 1st + 2nd US then difference resolved

Figure 1: Multivariable Linear Regression

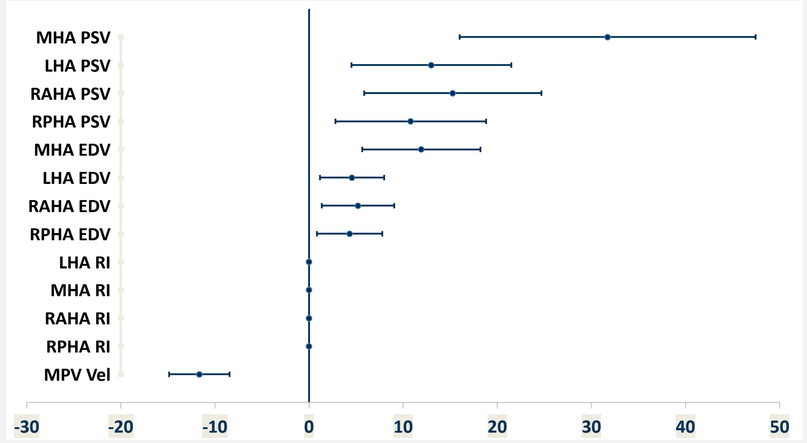
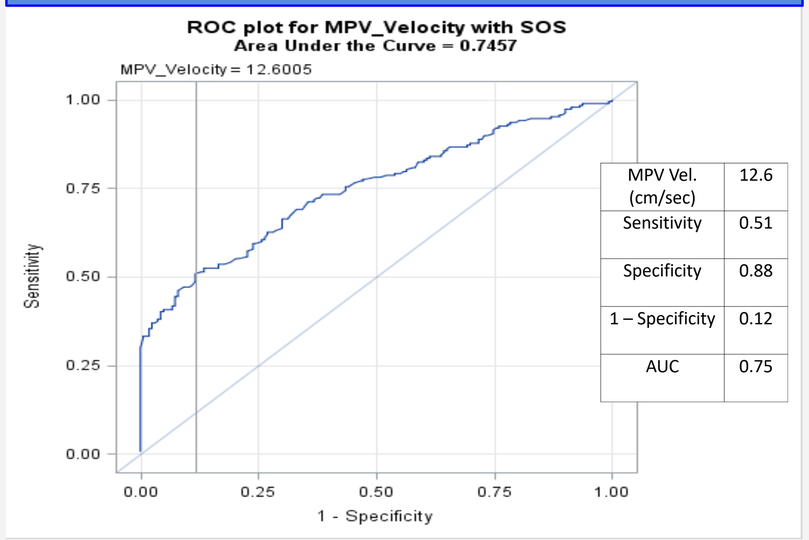


Figure 2: ROC Plot for MPV with SOS



CONCLUSION

- Decrease in MPV velocity is specific for presence of SOS
- Increase in peak-systolic and end-diastolic velocities of MHA are also associated with SOS
- Hepatic RIs are not associated with SOS

SUMMARY

- Doppler US variables including MPV velocity and MHA velocities may be used to help predict development of SOS
- Limitations include low study population and retrospective analysis (variable US timing relative to BMT date)
- Future directions include: multisite retrospective study and prospective studies with specific, uniform time points between US to determine accurate temporal relationship Doppler parameters with development of SOS

Credits/Disclosures/References

Disclosures:

Sherwin Chan has received grant funding from General Electric Company and he is on the medical advisory board for Jazz Pharma

References:

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