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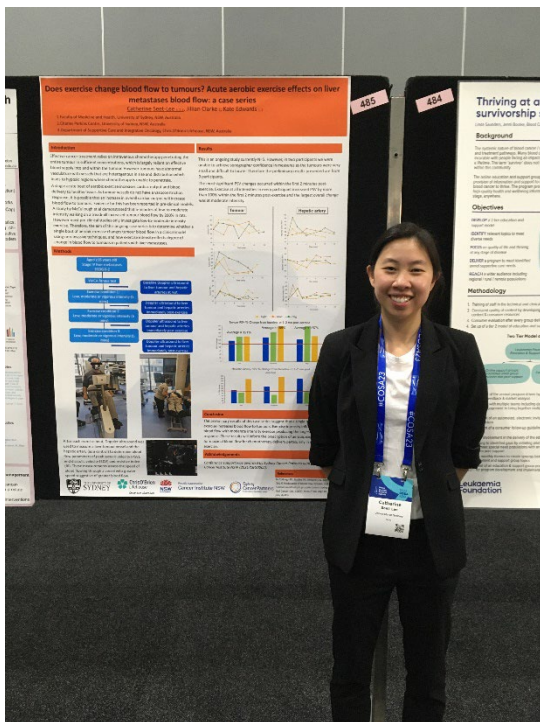
¹ Faculty of Medicine and Health, University of Sydney, ² Charles Perkins Centre, University of Sydney, ³ Department of Supportive Care and Integrative Oncology, Chris O'Brien Lifehouse. *Does exercise change blood flow to tumours? Acute aerobic exercise effects on liver metastases blood flow: a case series*

Conference/Meeting Name: COSA Annual Scientific Meeting

Location: Melbourne, Australia

Dates: 1-3 November 2023

Presentation Type: Poster



I was very excited to attend the COSA Annual Scientific Meeting in person this year particularly as this was my first in-person conference (due to COVID19 pandemic where most conferences were virtual). With over 1000 delegates, the conference was buzzing with excitement from the pre-conference workshop to the final keynote presentation.

The exercise oncology pre-conference workshop brought together exercise oncology clinicians and researchers to share the most up-to-date information on how to improve clinical care for patients. I particularly found interesting were the presentations from Rob Newtown, Sandi Hayes, Shelley Kay, Nic Hart and Prue Cormie all of whom have published research in my area of exercise oncology.

The main conference was insightful with presentations on lifestyle behaviours and breast cancer outcomes, exercise for lymphedema management, cardiotoxicity prevention, management of cancer-related fatigue and case study presentations. One of my key take home messages was the importance of the utilisation of Telehealth for cancer patients to access medical and allied health services.

With many previous conferences being held virtually, I was able to focus on my in-person networking skills. I was able to network with many fellow exercise oncology researchers whom I hope to collaborate with in the future. It was also a great opportunity to network with clinicians who I know from Sydney and new clinicians from interstate.

I presented my poster and had some great interest from researchers, medical doctors and Exercise Physiologists which highlighted the relevance of my current research in the growing wave of exercise

oncology research. The poster sessions had a broad range of research from basic science to translational research. It was encouraging to see a large number of posters that were related to exercise and physical activity which shows the growing acceptance of exercise oncology as an important part of standard patient care.

The personal highlights for me were watching Rob Newtown present in person, being able to network with people face to face after a long period of virtual meet-ups and visiting Melbourne for the first time.

I am very grateful to Sydney Cancer Partners for providing me with the opportunity to attend this conference. Being able to immerse myself with people who share research and clinical interests will enable me to use this experience to bridge the gap between research and clinical application.

Does exercise change blood flow to tumours? Acute aerobic exercise effects on liver metastases blood flow: a case series

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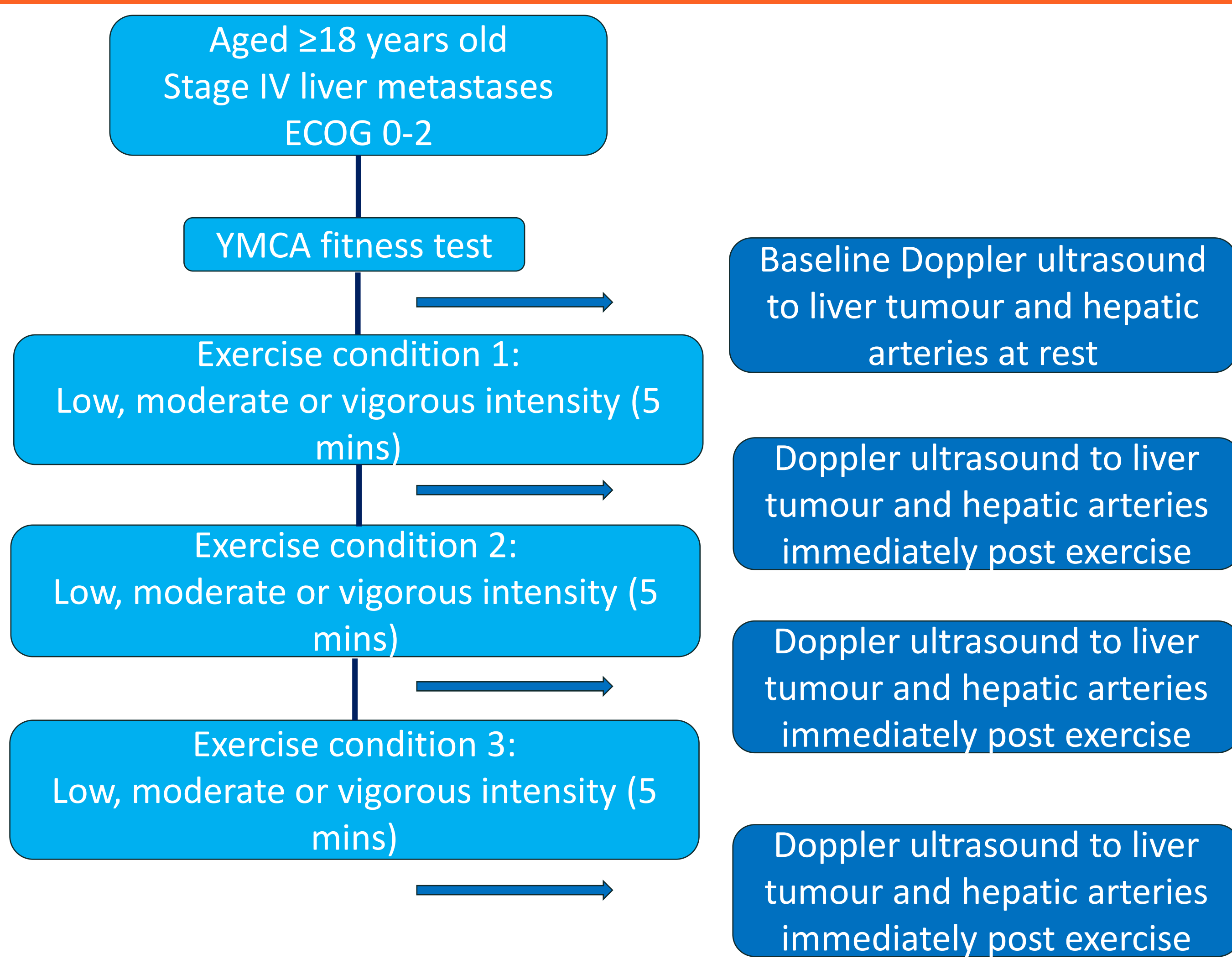
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Introduction

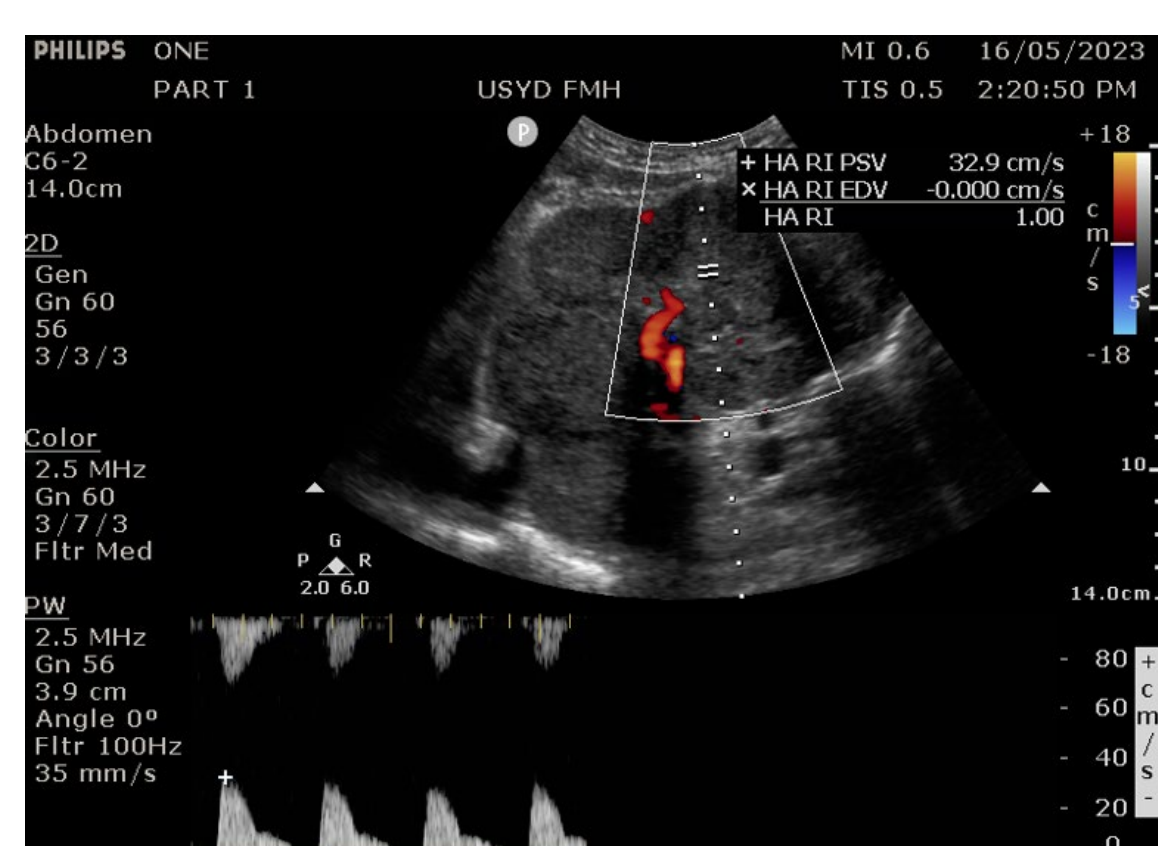
Effective cancer treatment relies on intravenous chemotherapy penetrating the entire tumour in sufficient concentrations, which is largely reliant on effective blood supply into and within the tumour. However tumours have abnormal vasculature with vessels that are heterogenous in size and distribution which leads to hypoxic regions where chemotherapy is unable to penetrate.

A single acute bout of aerobic exercise increases cardiac output and blood delivery to healthy tissue. As tumour vessels do not have a vasoconstriction response, it is possible that an increase in overall cardiac output will increase blood flow to tumours. Evidence for this has been reported in pre-clinical models. A study by McCullough et al demonstrated that 5-minutes of low-to-moderate intensity walking on a treadmill increased tumour blood flow by 200% in rats. However most pre-clinical studies only investigate low-to-moderate intensity exercise. Therefore, the aim of this ongoing case series is to determine whether a single bout of aerobic exercise changes tumour blood flow in a clinical model using non-invasive techniques, and how exercise intensity effects degree of change in blood flow to tumours in patients with liver metastases.

Methods



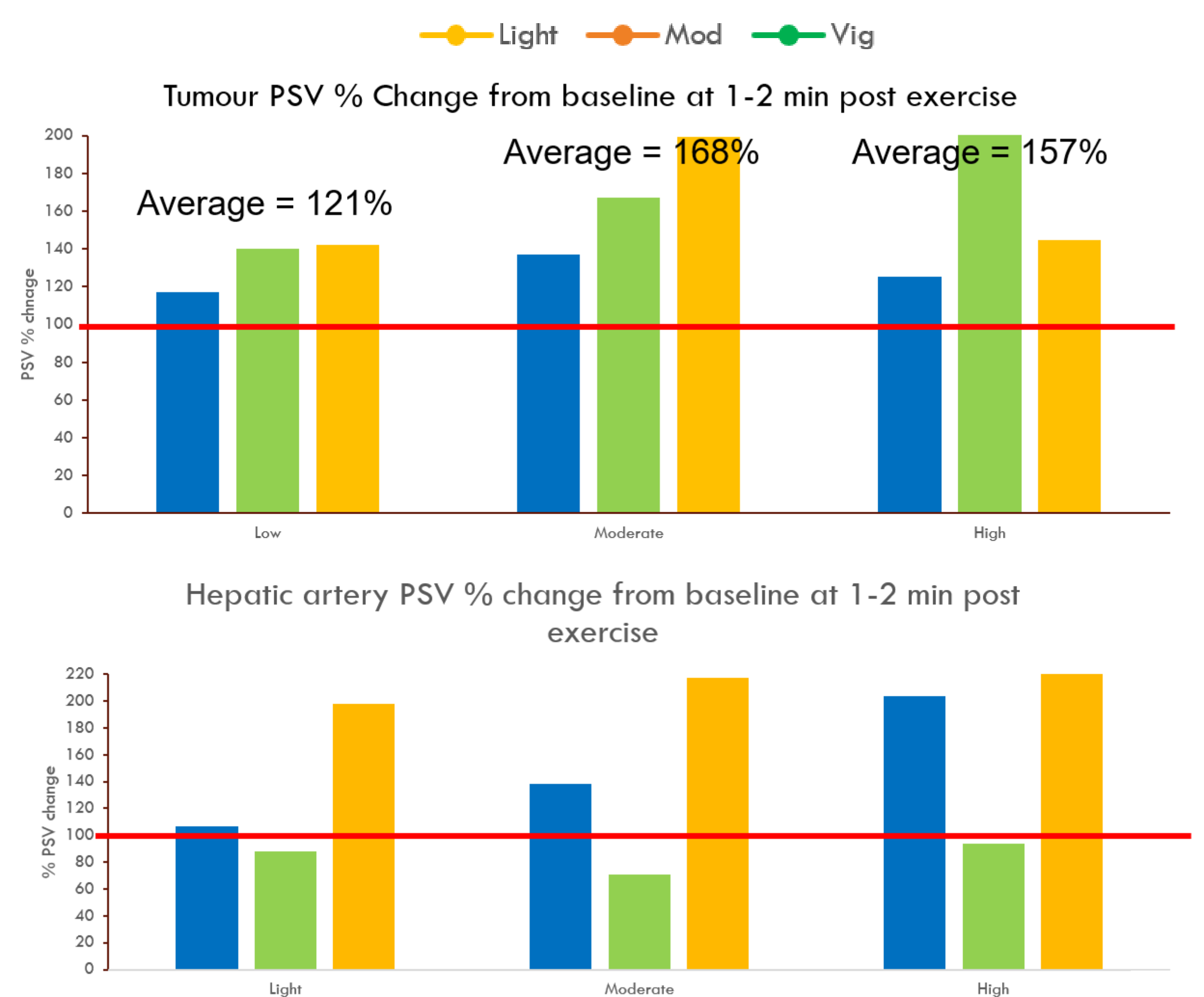
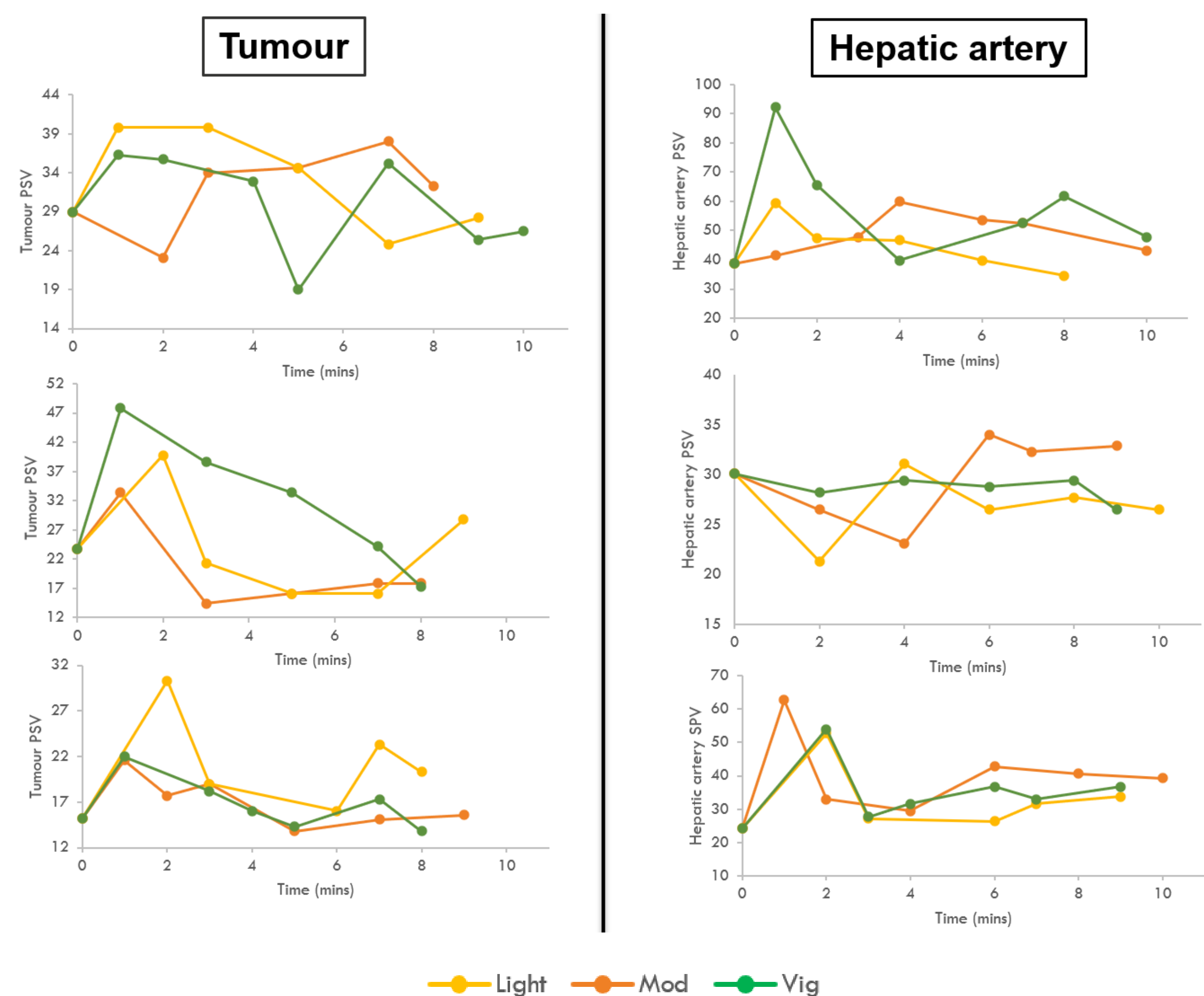
After each exercise bout, Doppler ultrasound was used to measure a liver tumour vessel and the hepatic artery (as a control) to determine blood flow parameters of peak systolic velocity (PSV), end diastolic velocity (EDV) and resistive index (RI). These measurements assess the speed of blood flowing through a vessel with greater speed suggestive of greater blood flow.



Results

This is an ongoing study currently N=5. However, in two participants we were unable to achieve sonographer confidence in measures as the tumours were very small and difficult to locate. Therefore the preliminary results presented are from 3 participants.

The most significant PSV changes occurred within the first 2 minutes post-exercise. Exercise at all intensities in every participant increased PSV by more than 100% within the first 2 minutes post-exercise and the largest overall change was at moderate intensity.



Conclusion

The preliminary results of this case series suggest that a single bout of aerobic exercise increases blood flow to tumours. Exercise intensity influences tumour blood flow with moderate intensity exercise producing the largest blood flow response. These results will inform the prescription of aerobic exercise intensity for maximal blood flow for chemotherapy delivery particularly in intra-infusion exercise.

Acknowledgements

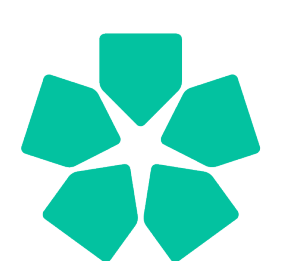
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References

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