"From the Trough"

Perioperative Interest Group Notes

Based on Cases discussed at the Weekly PIG Clinical Meeting on 8th February 2018. Publication date 15th February 2018.
Website: www.perioptalk.org

The imperfect opinions in these reports are only meant to stimulate discussion: - they should not be considered a definitive statement of appropriate standards of care.

TOPIC 1: **Investigation of a non-specific systolic murmur.**

An 84 year old male, late booking (due to geography) for lumbar decompression, seen the day before surgery. Was active until two years ago, but activity has reduced due to back pain and other issues. Has had four general anaesthetics for VPshunt insertions for normal pressure hydrocephalus in the last 8 months. Noted to have a nonspecific systolic murmur. Is it appropriate to go ahead without an Echo?

Discussion: - In the absence of symptoms, and no ECG changes, it is unlikely that the murmur would be hemodynamically significant. On the other hand, an echocardiogram has minimal morbidity and minimal likelihood of leading onto further (inappropriate) interventions or further investigations, which may delay surgery unnecessarily. But will it change management? Probably only if an unexpectedly severe (but asymptomatic) valve lesion is identified. More subtle findings of structural heart disease, significance of contractility, etc., on static echo are unlikely to justify postponing surgery in this situation. An 'urgent' echo, even by a lesser-skilled echo practitioner will clarify the issue of hemodynamic significance of the murmur. There may be some logistical difficulties in organising an 'urgent' echo investigation in situations such as this. It was generally felt that it would be good to have an echo prior to this procedure, however if it was absolutely not available, the case should go ahead.

TOPIC 2: **Transfusions in elective surgery – Becoming surprisingly infrequent!**

A recent audit has revealed the effect of changing practice with regard to transfusion thresholds. There were less than 100 transfusions in non-cardiac patients having elective surgery at JHH last year. A project reviewing the appropriate criteria for preoperative group and screen is underway. Given these figures, are we irrational in our use of IV infusion equipment? E.g. transfusion giving sets rather than normal intravenous fluid sets, and fluid warning sets on every patient? It was thought that pump sets are appropriate for patients having hip surgery, gynaecology and laparotomy but are they were being used unnecessarily in other patients? And does it matter?

Cost of Intravenous infusion sets is as follows:-

- Normal giving set - $3.64
- Pump giving set - $7.83
- 100cm extension with 3 way tap - $1.95
- PCA extension to patient cannula – with single valve – $2.84
- Four port extension – $11.98
- Quad extension (chook's claw) – $13.90
- Enflow fluid warming cassette – approx. $25

In summary: - It would seem well worthwhile being 'thoughtful' about using items such as multi-port extensions, chook's claws and (especially) warming cassettes unnecessarily.

TOPIC 3: High Risk Cardiac Patient for Bowel Surgery

An 83 year old male being prepared for a laparoscopic bowel resection. Being investigated for "dizzy episodes" aortic stenosis found on Echo – moderate "AS. Valve area 0.6cm2 but pressures not so bad (49/29) however this may reflect a failing ventricle. Background history of IHD and CABG. And there cardiologist said to go ahead but the anaesthetist, patient, and surgeon are not happy. The patient had been considered for TAVI but then had a valvuloplasty with a plan for surgery for colorectal resection 6 weeks post valvular plasty. The cardiologist doesn't want to do TAVI until after the bowel surgery "due to prognosis of the cancer"
Discussion: - It's not clear if any investigations that will reveal anything worthwhile. Stress Echo or Cpet probably won't add any further information. There needs to be better communication and discussion amongst all the practitioners involved to clarify the issue and understanding of the prognosis of both the cancer and the aortic stenosis before deciding where to go from here.

TOPIC 4: Target Haemoglobin; Iron and Cardiac Failure

A 75 year old male for a Right Hemicolectomy has a history of congestive cardiac failure due to cardiomyopathy (alcohol), AF, OSA. Echo: - EF 46%, dilated left ventricle moderate mitral regurgitation. Haemoglobin currently 86 due to bowel cancer and dabigatran.
Question:- What should be the management; What preop and intraop Hb targets?
Discussion: - Stop the dabigatran – the problems of ongoing blood loss outweighs risk of embolism. Check iron stores (Ferritin) but it is almost certain that the patient is short of iron. Iron infusion should improve anaemia. In 1 week the haemoglobin would be expected to rise by more than 10grams per litre so postponing for 1 to 2 extra weeks may be worthwhile. *What should be the target haemoglobin at time of surgery?* There were differing opinions. Studies such as TRICC suggest that a transfusion threshold of 70 is appropriate but given the history of CCF a higher threshold would be supported by some. There is probably no role for EPO in preparation of this patient as the anaemia is not due to bone marrow failure.

Iron infusion should improve Hb, but may also improve heart failure directly. This was originally suggested in the IRON-HF study in 2013 (Beck-da-Silva et al), with findings replicated in other studies, but is an active area of research and controversy. There is general consensus that iron therapy in iron deficiency is valuable in improving cardiac failure with evidence of reduced hospitalisation and improved exercise capacity, independent of benefit for improving anaemia. In the absence of iron deficiency, there is no clear evidence of benefit on heart failure directly.

SOME REFERENCES

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2. Beck-da-Silva L, Piardi D, Soder S, Rohde LE, Pereira-Barretto AC, de Albuquerque D, Bocchi E, Vilas-Boas F, Moura LZ, Montera MW, Rassi S. IRON-HF study: a randomized trial to assess the effects of iron in heart failure patients with anemia. International journal of cardiology. 2013 Oct 9;168(4):3439-42.

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4. Ebner N, Jankowska EA, Ponikowski P, Lainscak M, Elsner S, Sliziuk V, Steinbeck L, Kube J, Bekfani T, Scherbakov N, Valentova M. The impact of iron deficiency and anaemia on exercise capacity and outcomes in patients with chronic heart failure. Results from the studies investigating co-morbidities aggravating heart failure. International journal of cardiology. 2016 Feb 15;205:6-12.

ABSTRACT: Anaemia and iron deficiency (ID) are important co-morbidities in patients with chronic heart failure (HF) and both may lead to reduced exercise capacity. METHODS: We enrolled 331 out-patients with stable chronic HF (mean age: 64 +/- 11 years, 17% female, left ventricular ejection fraction [LVEF] 35 +/- 13%, body mass index [BMI] 28.5 +/- 5.2 kg/m(2), New York Heart Association [NYHA] class 2.2 +/- 0.7, chronic kidney disease 35%, glomerular filtration rate 61.7 +/- 20.1 mL/min). Anaemia was defined according to World Health Organization criteria (haemoglobin [Hb] < 13 g/dL in men, < 12 g/dL in women). ID was defined as serum ferritin < 100 mug/L or ferritin < 300 mug/L with transferrin saturation (TSAT) < 20%. Exercise capacity was assessed as peak oxygen consumption (peak VO2) by spiroergometry and 6-minute walk test (6MWT). RESULTS: A total of 91 (27%) patients died from any cause during a mean follow-up of 18 months. At baseline, 98 (30%) patients presented with anaemia and 149 (45%) patients presented with ID. We observed a significant reduction in exercise capacity in parallel to decreasing Hb levels (r = 0.24, p < 0.001). In patients with anaemia and ID (n = 63, 19%), exercise capacity was significantly lower than in patients with ID or anaemia only. Cox regression analysis showed that after adjusting for NYHA, age, hsCRP and creatinine anaemia is an independent predictor of mortality in patients with HF (hazard ratio [HR]: 0.56, 95% confidence interval [CI]: 0.33-0.97, p = 0.04). CONCLUSION: The impact of anaemia on reduced exercise capacity and on mortality is stronger than that of ID. Anaemia remained an independent predictor of death after adjusting for clinically relevant variables.

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AB Iron deficiency (ID) has been identified as an important co-morbidity in patients with heart failure (HF). Intravenous iron therapy reduced symptoms and rehospitalizations of iron-deficient patients with HF in randomized trials. The present multicenter study investigated the "real-world" management of iron status in patients with HF. Consecutive patients with HF and ejection fraction <=40% were recruited and analyzed from December 2010 to October 2015 by 11 centers in Germany and Switzerland. Of 1,484 patients with HF, iron status was determined in only 923 patients (62.2%), despite participation of the centers in a registry focusing on ID and despite guideline recommendation to determine iron status. In patients with determined iron status, a prevalence of 54.7% (505 patients) for ID was observed. Iron therapy was performed in only 8.5% of the iron-deficient patients with HF; 2.6% were treated with intravenous iron therapy. The patients with iron therapy were characterized by a high rate of symptomatic HF and anemia. In conclusion, despite strong evidence of beneficial effects of iron therapy on symptoms and rehospitalizations, diagnostic and therapeutic efforts on ID in HF are low in the actual clinical practice, and the awareness to diagnose and treat ID in HF should be strongly enforced.

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Abstract Background: Iron deficiency is common in patients with heart failure (HF) and is associated with reduced exercise capacity and poor outcomes. Whether correction of iron deficiency with (intravenous) ferric carboxymaltose (FCM) affects peak oxygen consumption [peak VO_2], an objective measure of exercise intolerance in HF, has not been examined. Methods: We studied patients with systolic HF (left ventricular ejection fraction <=45%) and mild to moderate symptoms despite optimal HF medication. Patients were randomized 1:1 to treatment with FCM for 24 weeks or standard of care. The primary end point was the change in peak VO_2 from baseline to 24 weeks. Secondary end points included the effect on hematinic and cardiac biomarkers, quality of life, and safety. For the primary analysis, patients who died had a value of 0 imputed for 24-week peak VO_2. Additional sensitivity analyses were performed to determine the impact of imputation of missing peak VO_2 data. Results: A total of 172 patients with HF were studied and received FCM (n=86) or standard of care (control group, n=86). At baseline, the groups were well matched; mean age was 64 years, 75% were male, mean left ventricular ejection fraction was 32%, and peak VO_2 was 13.5 mL/min/kg. FCM significantly increased serum ferritin and transferrin saturation. At 24 weeks, peak VO_2 had decreased in the control group (least square means -1.19±0.389 mL/min/kg) but was maintained on FCM (-0.16±0.387 mL/min/kg; P=0.020 between groups). In a sensitivity analysis, in which missing data were not imputed, peak VO_2 at 24 weeks decreased by -0.63±0.375 mL/min/kg in the control group and by -0.16±0.373 mL/min/kg in the FCM group; P=0.23 between groups). Patients' global assessment and functional class as assessed by the New York Heart Association improved on FCM versus standard of care. Conclusions: Treatment with intravenous FCM in patients with HF and iron deficiency improves iron stores. Although a favorable effect on peak VO_2 was observed on FCM, compared with standard of care in the primary analysis, this effect was highly sensitive to the imputation strategy for peak VO_2 among patients who died. Whether FCM is associated with an improved outcome in these high-risk patients needs further study.