

Ovarian Cytoreductive Surgery (CRS): The post-operative challenges, have they improved?

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Introduction

Ovarian cancer is the second most common cancer of the female genital tract, and the leading cause of gynaecological cancer death in the UK. It is the 6th most common cancer in females in the UK, with over 7,500 new cases each year. The projected rate of rise of ovarian cancer incidence is 15% by the year 2035, with 32 cases per 100,000 of the population. Most patients present with advanced disease and the development of malignant ascites, which can lead to extensive intra-operative fluid loss and large fluid shifts. Mortality rates are falling, largely due to improved cytoreductive surgery and oncological adjuvant treatments such as chemotherapy and radiotherapy.

Cytoreductive surgery (CRS) is very extensive surgery, either being complete (removing all macroscopic disease within the abdomen and pelvis) or optimal (removing disease with diameter >1cm). Surgery involving procedures in the upper abdomen such as diaphragmatic stripping, splenectomy or liver resection is termed ultra-radical surgery.

A prior case series of patients presenting to a tertiary centre critical care unit post-operatively after CRS showed:

- Median age 72 years and 78% had Group 3 disease (inc. upper abdominal procedures)
- The mean length of critical care stay was 47hrs (IQR 26-67)
- Median duration of vasopressor support was 36.5hrs (IQR 27-54)
- 10% of patients suffered acute renal injury or failure with a further 14% determined as "at risk".
- 10% of patients suffered from respiratory complications, including documented atelectasis and pleural effusions with requirements for both non-invasive and invasive ventilator support.
- Median fluid balance in the first 24hrs 1583ml (IQR 1988-3602ml), with median fluid input in the first 24hrs of 4410ml (IQR 3603-5663ml).

References

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Objective

To determine whether aggressive, goal-directed intra-operative fluid management (GDFM) guided by cardiac output monitoring (COM) has improved patient post-operative outcomes.

The use of goal-directed haemodynamic therapy during the peri-operative phase aims to try and match the delivery with the increased demand for oxygen during a major surgical insult. In higher-risk patients, they may have decreased physiological reserve to be able to deal with the increase metabolic requirements seen during the stress response. Therapeutic interventions can be goal-directed fluid therapy, with or without the use of inotropes, depending on the protocol being followed. Research so far has suggested, in appropriate patient cohorts, a reduction in short and long-term mortality and overall complication rates by following a goal-directed protocol.

Method

Over a 6 month period, 10 patients undergoing CRS for advanced ovarian cancer had their surgery with a COM during their intra-operative management (keeping the SVV <10) and for 24hrs post-operatively. Data was collected retrospectively from all 10 cases. Of these 10, 5 received post-operative care in the critical care unit

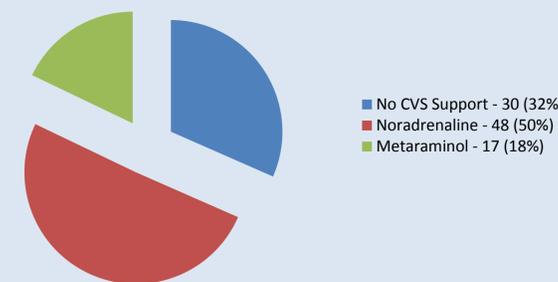
Results

Cardiovascular support
No abnormal arrhythmias

	Median	25 th -75 th
Noradrenaline maximum dose (mcg/kg/min)	0.07	0.05-0.14
Metaraminol maximum dose (mg/hr)	0	0
Duration of vasopressor support (hrs)	19	10-66

Table 1 – Vasopressor requirements

Cardiovascular Support Pre-COM



Cardiovascular Support - with COM

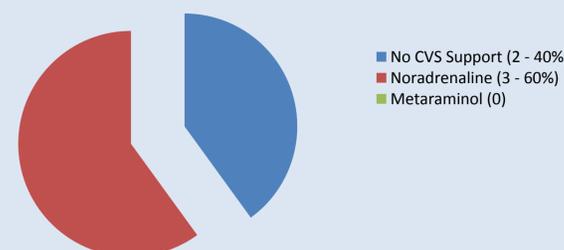


Fig 1 and 2 – number of patients receiving vasopressor support

Respiratory Complications:

No atelectasis, pleural effusions, pneumonia, IPPV/NIV.

Renal Complications:

As per the RIFLE criteria (No injury, Risk, Injury, Failure, Loss, ESRD)

No injury in any of the 5 patients

Gastrointestinal Complications:

No documented ileus or anastomotic leaks.

Length of stay (LOS):

Mean LOS in hours is now 38 (Median 21hrs, IQR 17-69hrs)

Fluid input and balance:

Median balance first 24hrs 1626ml (IQR -576-1961ml), median input in the first 24hrs 4217ml (IQR 2149-5243ml).

	Hb Adm (g/L)	Hb D1 (g/L)	Plts Adm (10 ⁹ /L)	Plts D1 (10 ⁹ /L)	INR Adm	INR D1	SOFA Adm	SOFA D1
Median	146	132	269	237	1.1	1.1	4	3
25-75 th	117-156	115-141	177-378	198-326	1-1.15	1-1.35	0.5-4	1-4.5

Adm = admission to critical care, D1 = 24hrs post-operatively, SOFA = Sequential Organ Failure Assessment Score
Table 2 Blood results.

There was a median drop of 14g/L in Haemoglobin concentration. None of the patients required a blood transfusion. There was no evidence of coagulopathy. SOFA scores risk stratified the patients to be in the lowest risk category for ICU mortality (<10%) throughout their stay.

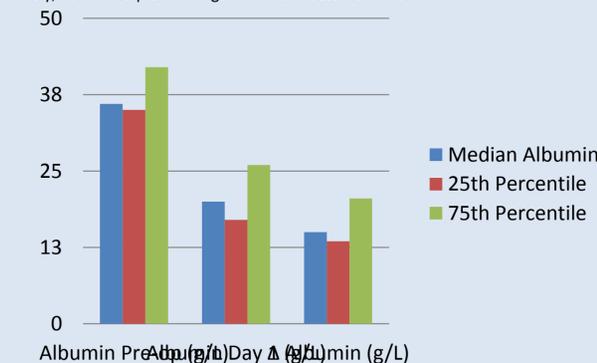


Fig 3 Albumin concentration

A significant drop in serum albumin was noted, with a median drop of 15 g/L (a drop of 16 g/L in prior case series).

Conclusion

Although numbers are small, there is a suggestion of a clear improvement in patient outcomes and use of finite resources with intra-operative goal-directed fluid management assisted with a COM. There is evidence of decreased requirements for vasopressors and for a decreased length of time. Numbers of patients developing multi-system post-operative complications are reduced. After looking at initial data, we are hoping this will help support a business case to fund permanent cardiac output monitors to help develop an intra-operative GDFM protocol for our tertiary centre.