TESTING PREDICTION ACCURACY OF HDU ADMISSION FOLLOWING HIGH GRADE SEROUS ADVANCED OVARIAN CANCER CYTOREDUCTIVE SURGERY USING MACHINE LEARNING METHODS

Alexandros Laios¹, Camilo De Lelis Medeiros-de-Morais², Yong Tan¹, Gwendolyn Saalmink³, Mohamed Othly¹, Angelika Kaufmann¹, Tim Broadhead¹, Richard Hutson¹, Kassio Michell Gomes de Lima⁴, George Theophiliou¹, ¹St James’s University Hospital; Leeds Teaching Hospitals; Gynaecologic Oncology; ²School of Pharmacy and Biomedical Science; University of Central Lancashire; ³St James’s University Hospital; Research and Innovation Centre; ⁴Federal University of Rio Grande Do Norte; Chemistry

Introduction/Background Advanced high grade serous ovarian cancer patients (HGSOC) frequently require extensive procedures including bowel resections and upper abdominal surgery potentially necessitating HDU/ICU support and prolonged hospitalisation. HDU/ICU admission is a measurable outcome that can be used as a benchmark of surgical care. Modern data mining technologies such as Machine Learning (ML), a subfield of Artificial Intelligence, could be helpful in monitoring HDU/ICU admissions to improve standards of care. We aimed to improve the accuracy of predicting HDU admission in that cohort of patients by use of ML algorithms.

Methodology A cohort of 176 HGSOC patients, who underwent surgical cytoreduction from Jan 2014 to Dec 2017 was selected from the ovarian database. They were randomly assigned to ‘training’ and ‘test’ subcohorts. ML methods including Classification and Regression Trees (CART) and Support Vector Machine (SVM), were employed to derive predictive information for HDU/ICU admission from a list of selected preoperative, intraoperative, and postoperative variables. These methods were tested against conventional linear regression analyses.

Results There were 29 out of 176 (16.4%) HDU/ICU admissions; 23 admissions were elective whilst six were unplanned admissions. For the outcome of HDU/ICU admission, both ML methods outperformed conventional regression by far (table 1). Bowel resection and operative time were the most predictive variables (figure 1). HDU/ICU admission was not associated with increased length of stay, increased number of postoperative complications, and increased risk of readmission within 30 days.

Conclusion We refined risk-adjusted predictors for HDU admission and we tested the feasibility of ML models allowing the adjustment for case mix when auditing the HDU admission as a proxy indicator of the quality of care. Predictive ML algorithms may facilitate quality improvement of modern care by improving prediction accuracy for HDU/ICU admission. For this inherently high-risk population, this information is critical when counseling patients about peri-operative risks in cytoreductive surgery.

Disclosures No disclosures.

MIRRORS TRIAL: MINIMALLY INVASIVE ROBOTIC SURGERY, ROLE IN OPTIMAL DEBULKING OVARIAN CANCER, RECOVERY & SURVIVAL

1Christina Uwins, ²Agnieszka Michael, ¹Anil Tailor, ¹Jayanta Chatterjee, ¹Patricia Ellis, ¹Thumuluru Madhuri, ³Simon Skene, ³Simon Butler-Manuel. ¹Royal Surrey NHS Foundation Trust; The Academic Department of Gynaecological Oncology; ²University of Surrey; School of Biosciences and Medicine; ³University of Surrey; Clinical Trials Unit, University of Surrey; School of Biosciences and Medicine

Introduction/Background MIRRORS is a UK based prospective feasibility study opened June 2020, following ethics approval. Its purpose is to establish the feasibility of launching a randomised control trial (RCT) of Robotic interval debulking surgery for ovarian cancer (including cancer of the fallopian tube & peritoneum) MIRRORS-RCT in the future.

MIRRORS will focus on the feasibility of obtaining consent from women and the acceptability of Robotic interval debulking surgery for advanced ovarian cancer.

Methodology Women will be identified through the Gynaecological Oncology multi-disciplinary team meeting.

Inclusion Criteria
- adult women ≥18 years with stage IIIc–IVb ovarian cancer (including cancer of the fallopian tube & peritoneum)
- undergoing neo–adjuvant chemotherapy
- considered suitable for interval debulking surgery (IDS).
- ≤8 cm pelvic mass on CT

Abstract Table 1

<table>
<thead>
<tr>
<th>Method</th>
<th>Accuracy</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CART</td>
<td>80%</td>
<td>57%</td>
<td>84%</td>
</tr>
<tr>
<td>SVM</td>
<td>86%</td>
<td>57%</td>
<td>91%</td>
</tr>
<tr>
<td>Logistic Regression</td>
<td>60%</td>
<td>28.5%</td>
<td>93.1%</td>
</tr>
</tbody>
</table>

Abstract Figure 1
Exclusion Criteria

- Pelvic Mass >8 cm
- open surgical approach considered necessary following MDT review.
- Women lacking capacity to the extent they are unable to understand or complete trial documentation/questionnaires will be excluded from the trial.

MIRRORS inclusion criteria are intentionally wide, not restricting by Body Mass Index (BMI), patient comorbidity or Ca125 values.

Surgery will commence with an initial laparoscopic assessment followed by a decision to proceed to robotic or open interval debulking surgery. The aim of surgery is to remove all visible disease safely by whichever route. If conversion to open surgery is required to complete this, then it will be done.

Results All women recruited to MIRRORS, whether eventually undergoing robotic or open surgery, will be followed up to assess recovery, complication rate, pain and quality of life.

If the following Success Criteria are met, we will progress to MIRRORS-RCT:

- ≥20% of women eligible for the study accept inclusion in MIRRORS.
- Robotic IDS Complication rate is not higher than for open interval debulking surgery

CONCLUSION

- Conversion to open surgery rate not greater than 50% in patient group deemed suitable for Robotic IDS following initial diagnostic laparoscopy.

DISCLOSURES

- Anil Tailor: Proctor for Intuitive Surgical
- Jayanta Chatterjee: paid-lectures on behalf of pharmaceutical companies
- Agnieszka Michael: Educational-grants: Clovis, GSK, Ipsen, Novartis, Pfizer, and Tesaro
- Simon Butler-Manuel: Proctor for Intuitive Surgical, Plasma Surgical & Ethicon

Abstracts

ENGOT-EN6/GOG-3031/NSGO-RUBY: A PHASE 3, RANDOMISED, DOUBLE-BLIND, MULTICENTER STUDY OF DOSTARLIMAB + CARBOPLATIN-PACLITAXEL VERSUS PLACEBO + CARBOPLATIN-PACLITAXEL IN RECURRENT OR PRIMARY ADVANCED ENDOMETRIAL CANCER (EC)

MIRRIES

Minimally Invasive Robotic Surgery, Role in Optimal/Debulking Ovarian Cancer, Recovery & Survival

Case identification / Screening (1/2)
- Adult women with Stage III/IV Ovarian cancer (including cancer of the fallopian tube & peritoneum)
- Undergoing neo-adjuvant Chemotherapy
- Considered suitable for interval debulking surgery (IDS)
- pelvic mass ≤12 cm
- Open surgery not required for other surgical specialty intervention

Initial consultation
- Patient Information Leaflet & MIRRORS
- Consent form growth in participant

Consent

Diagnostic Laparoscopy

Robotic IDS

Open IDS

Day 1 post surgery
- Pain Assessment
- Questionnaires

Follow up 1: 3-6 Weeks post-surgery
- Pain Assessment
- Questionnaires
- Postoperative CT findings
- Patient interview (3-6 weeks post)

Follow up 2: 3 months +/- 15 days
- Pain Assessment
- Questionnaires

Background

Carboplatin-paclitaxel is standard systemic anti-cancer therapy for recurrent or advanced EC for which surgery and/or radiation are not curative. Dostarlimab (TSR-042) is an anti-programmed cell death (PD)-1 humanised monoclonal antibody that has demonstrated antitumour activity and an acceptable safety profile in patients (pts) with recurrent or advanced EC in the GARNET trial. The RUBY trial will evaluate the efficacy and safety of dostarlimab in combination with carboplatin-paclitaxel in recurrent or primary advanced EC compared with carboplatin-paclitaxel alone.

Trial Design

This is a global, randomised, double-blind, multicenter, placebo-controlled study. Eligible pts must have first recurrent or primary stage III or stage IV EC with a low potential for cure by radiation therapy or surgery alone or in combination. Pts with carcinosarcoma are eligible for enrolment. 470 pts will be enrolled from approximately 160 sites in the ENGOT countries, United States, and Canada. Stratification factors are DNA mismatch repair status (proficient [p], or deficient [d] MMR), prior external pelvic radiotherapy (yes or no), and disease status (recurrent, primary stage III or primary stage IV). Pts will be randomised 1:1 to receive combination dostarlimab 500 mg or placebo + carboplatin AUC 5 + paclitaxel 175 mg/m2 every 3 weeks for 6 cycles followed by dostarlimab 1000 mg or placebo monotherapy every 6 weeks for up to 3 years in the absence of progressive disease, death, unacceptable toxicity, or patient/physician decision to continue.
Correction: 255 Mirrors trial: minimally invasive robotic surgery, role in optimal debulking ovarian cancer, recovery & survival


A figure should have been published with this abstract, but it was omitted. This has been included below.

© Author(s) (or their employer(s)) 2021. No commercial re-use. See rights and permissions. Published by BMJ.

*Int J Gynecol Cancer* 2021;31:e4. doi:10.1136/ijgc-2020-ESGO.196corr1