SUBOPTIMAL CYTOREDUCTIVE PREDICTION SOFTWARE FOR ADVANCED OVARIAN CANCER

DESCRIPTION OF THE TECHNOLOGY

The major prognostic factor related to the survival of patients with advanced ovarian cancer is cytoreduction surgery, which succeeds in eliminating the entire macroscopic tumor from the patient's abdomen, which is called complete surgery. Cytoreduction surgery consists of a single intervention with multiple intraoperative procedures that make the technical difficulty of this type of intervention very important. So much so that in a variable percentage it is not possible to eliminate the entire tumor from the patient's abdomen, this is what is called suboptimal surgery. This last situation is associated with a possible increase in morbidity and a delay in the initiation of chemotherapy that could decrease the survival of these patients. Therefore, the most important challenge for surgical teams dedicated to the treatment of advanced ovarian cancer is to decide which patient is going to benefit from primary surgery and which patient should be send for neoadjuvant therapy in order to reduce tumor size with chemotherapy before surgery.

In order to facilitate clinical decisions for these surgical teams, this predictive model has been designed.

The objective of this APP is to help in the prognosis of achieving suboptimal surgery in the surgical treatment of advanced ovarian cancer, indicating a risk or probability of having achieved that suboptimal surgery, and allowing the clinical professional to make a decision regarding the choice of the most appropriate therapeutic strategy.

It consists of 2 prognostic models, R3 and R4, based on the determination of the Peritoneal Carcinomatosis Index (PCI) obtained in the preoperative period with the Computerized Axial Tomography (CT), the PCI obtained by staging by Laparoscopy, the one obtained in the surgical exploration of the peritoneal cavity (operative PCI), as well as the existence of intestinal obstructive signs in any of the mentioned diagnostic tests.

The R3 model includes exclusively preoperative diagnostic tests: CT-scan and Laparoscopy if it has been performed, and the possible signs of total or partial intestinal obstruction. The R4 model adds to the above the result of the operative PCI.

The models R3 and R4 can be considered as a diagnostic test that includes the other tests mentioned. As such, they have their own Sensitivity and Specificity, and establish an initial prognosis based on these diagnostic indices. But obtaining a definitive diagnosis (Final Prognosis or Positive Predictive Value) of the possibility of suboptimal surgery requires the integration of the prevalence of existing suboptimal surgery. This prevalence is represented by the percentage of suboptimal surgery that has until that moment who applies the model to his specific patient. Each prognostic model offers explicit results along with a spectrum of uncertain outcomes and thus supports the clinical decision.

The software proposes that for suboptimal surgery, a positive predictive value of up to 35% be considered as "suboptimal IMPROBABLE cytoreductive surgery", between 35% and 69% as "UNCERTAINABLE", and 70% onwards as "PROBABLE suboptimal cytoreductive surgery".

However, both this model and any other prognostic model must be adapted by each user who uses it, before it can be considered effective for regular use, depending on the experience of your team and the percentage of suboptimal surgery in which you work until this mathematical model is applied. Therefore, it is important for each user to verify to what extent the final prognosis obtained by the model coincides with the final result of the suboptimal surgery in a series of cases in which it has been applied.

MARKET APPLICATION SECTORS

Biotechnology companies, hospitals and oncology units with implications in the treatment of ovarian cáncer.

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

The software is a medical decision support that allows adequate decision making by reducing the number of suboptimal surgeries.

This reduction would lead to great savings in terms of patient survival and morbidity with the consequent high socioeconomic costs.

It is easy to adapt to the conditions of each medical team/hospital to provide optimal results.

It adapts evolutionarily to improvements in the care of this type of patient over time.

The sensitivity is higher than other predictive software available on the market.

CURRENT SATATE OF DEVELOPMENT

The software has been validated with 110 patients with advanced ovarian cancer. The sensitivity of the method is 69% for the R3 model and 83% for the R4 model.

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Registered software owned by the Universitat Jaume I and FISABIO registered at the Universitat Jaume I with registration number 1403 and Registration Date: 12-10-2019.

COLLABORATION SOUGHT

It would be necessary the collaboration of a company to finish with the clinical validation and make the software available to the users.

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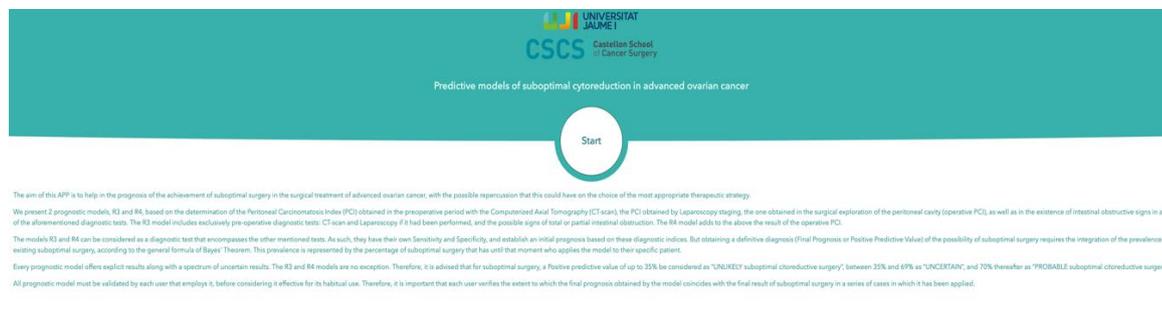
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