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POSTER ABSTRACT

Identifying women at high risk of ovarian cancer

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Introduction: Every year about 7000 women in the UK are diagnosed with ovarian cancer. That is, about 20 women per day. Prognosis is often poor because the disease presents with vague symptoms and present with advanced disease. It is imperative that there is increased awareness of ovarian cancer and earlier diagnosis.

We have looked at relative risk of patients with and without ovarian cancer. The presenting symptoms and many predisposing factors are known and collected data has been analysed by mathematical health modellers using machine learning.

We have developed an algorithm that has high predictive values for identifying women who are at high risk of going onto develop Ovarian Cancer.

Aims, Objectives, Theory or Methods: Preliminary work suggest that use of artificial intelligence methodology may diagnose women at risk of ovarian cancer with a high degree of confidence and therefore allow for earlier intervention with kinder, more economically treatments and care pathways.

Our objective is, by identifying women who at high risk of going onto develop ovarian cancer will reduce the burden and costs on the primary and secondary health care systems.

The end point of this project is to produce a Telephone APPlication free to download. Women can use the app to see if they are part of the high risk group and take action with their GP.

Highlights or Results or Key Findings: The machine learning tool (algorithm) that has been developed shows extremely high predictive values for sensitivity and specificity which have gone through two stages of validation.

The ability to identify Negative and Positive Predictive Values (NPV & PPV). The validation process using the KNeighborsClassifier (KNN) also gives high precision and accuracy readings

This tool has a reasonable to good outcome for false negatives, the team is working on improving this data. The more data that is inputted to this tool the more accurate it will become.

The Receiver Operating Characteristic curve (ROC) (Area Under The Curve) also shows good results.

In general an AUC of 0.5 gives no discrimination between those who have the disease and those that do. An AUC of between 0.8 and 0.9 is considered excellent. The predictive tool in question has an ROC/AUC of 0.881.

Conclusions: The aim is to find women in advance of where the Nice Guidelines begin, this tool gives the opportunity to achieve this.

The machine learning tool is Heuristic and therefore will go on improving itself the more data that is inputted.

Implications for applicability/transferability, sustainability, and limitations: The eventual driver of this project will be the 'patient' through the use of on-line checker and information package contained within the APPlication

The project displays integrated care research leading to Policy, Practice and Education.

The Patient and Public involvement comes through working with research funders to prioritise research .

Initially the limitations are that we have no specialised centres of diagnosis/treatment to send our women to.