Prognostic biomarkers to identify patients likely to develop severe Crohn's disease: a systematic review

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Plain English summary

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Crohn's disease causes inflammation of the intestines. Traditional treatment uses drugs, such as steroids, at a gradually increasing dose as symptoms worsen. Newer 'biological' drugs may stop disease, but are not used as an early treatment because they are expensive and have serious side effects. Using biologicals early means knowing which patients will develop severe disease in the future.

A 'prognostic biomarker' is a measurement made on a patient that predicts a future outcome. A lot of research has attempted to identify biomarkers that predict severe Crohn's disease, but research is haphazard and of variable quality. We therefore carried out a 'systematic review', which identifies research in a comprehensive and unbiased fashion. We found nearly 30,000 research papers, 71 of which were acceptable quality and described 56 groups of Crohn's disease patients. We then used a statistical method called 'meta-analysis' to combine results from multiple studies. This allowed us to identify the most promising biomarkers to predict future severe disease. We found five clinical biomarkers (e.g. age and smoking), two blood biomarkers and one genetic biomarker that seemed reasonably able to predict future severe Crohn's disease.

However, we also found that most research was poorly performed and frequently confused diagnosis (current disease) with prognosis (future disease). Some commonly used biomarkers were not sufficiently investigated. We were surprised to identify so few prognostic biomarkers in the face of a seemingly vast amount of research.

Future research should be better conducted and not confuse diagnosis with prognosis. We will use statistical methods to combine the promising biomarkers that we identified into a 'prognostic model', which is a mathematical formula that provides the likelihood of developing severe disease in the future. We will then test how well this works by using patient data from existing Crohn's disease databases.

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