Understanding digestive bleeding: Causes, diagnosis, and treatment options.

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Introduction

Peptic ulcer disease is a major cause of morbidity and mortality in the US with more than six million diagnoses annually. Ulcers are reported as the most common cause of hospitalization for upper Gastrointestinal (GI) bleeding and are often a clinical concern due to the widespread use of aspirin and nonsteroidal anti-inflammatory drugs, both of which have been shown to induce ulcer formation. The finding that Helicobacter pylori infection (independent of aspirin use) is associated with the development of ulcers led to a more thorough understanding of the causes and pathogenesis of ulcers and an improvement in therapeutic options. However, many patients infected with H. pylori are asymptomatic and remain undiagnosed. Complicating matters is a current lack of understanding of the association between aspirin use and asymptomatic ulcer formation. Low-dose aspirin prescriptions have increased, particularly for cardioprotection. Unfortunately, the GI side effects associated with aspirin therapy continue to be a major complication in both symptomatic and asymptomatic patients. These safety concerns should be important considerations in the decision to use aspirin and warrant further education. The medical community needs to continue to improve awareness of aspirin-induced GI bleeding to better equip physicians and improve care for patients requiring aspirin therapy [1].

Inflammatory intestinal diseases such as Crohn's disease and ulcerative colitis have seen an increase in their prevalence in developing countries throughout the current decade. These are caused by a combination of genetic and environmental factors, altered immune response, intestinal epithelium disruption and dysbiosis in the gut microbiome. Current therapies are mainly focused on treating symptoms and are often expensive and ineffective in the long term. Recently, there has been an increase in our understanding of the relevance of the gut microbiome and its impact on human health. Advances in the use of probiotics and synthetic biology have led to the development of intestinal biosensors, bacteria engineered to detect inflammation biomarkers that work as diagnostic tools. Additionally, live biotherapeutics have been engineered as delivery vehicles to produce treatment in situ avoiding common complications and side effects of current therapies. These genetic constructs often express a therapeutic substance constitutively, but others could be regulated externally by specific substrates, making the production of their treatment more efficient. Additionally, certain probiotics detecting specific biomarkers in situ and responding by generating a therapeutic substance are beginning to be developed. While most studies are still in the laboratory stage, a few modified probiotics have been tested in humans. These advances indicate that live biotherapeutics could have great potential as new treatments for inflammatory intestinal diseases [2].

Upper GastroIntestinal Bleeding (UGIB) is defined as originating in the distal esophagus, stomach, and duodenum (proximal to the ligament of Treitz). The most common cause of nonvariceal UGIB is peptic ulcer disease. Other less common causes include benign and malignant tumors, ischemia, gastritis, arteriovenous malformations such as Dieulafoy's lesions, Mallory-Weiss tears, trauma and iatrogenic causes Effective treatment requires timely and accurate diagnosis (location and etiology), and unlike lower gastrointestinal bleeds, most patients have undergone endoscopic examination and treatment prior to their referral to interventional radiology [3].

Improving screening rates among lower-income populations requires addressing barriers across the multiple levels, structural, personal, health care system, that patients encounter in seeking care for colorectal cancer. Acknowledging the complex, multilevel influences impacting patient health care choices and behaviors allows for the development of culturally tailored interventions, and educational, financial, and community resources to decrease disparities in cancer screening and care and improve outcomes for these at-risk patients. Acute GastroIntestinal (GI) dysfunction and failure have been increasingly recognized in critically ill patients. The variety of definitions proposed in the past has led to confusion and difficulty in comparing one study to another. An international working group convened to standardize the definitions for acute GI failure and GI symptoms and to review the therapeutic options [4, 5].

Conclusion

Deep learning is a highly powerful and useful technique which has facilitated the development of various fields, including bioinformatics. With the advancement of the big data era in biology, to further promote the usage of deep learning in bioinformatics, in this review, we first reviewed the achievements of deep learning. After that, we gave a brief and easy-to-understand introduction from shallow neural networks, to legendary convolutional neural networks, legendary recurrent neural.

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