

Anemia and digestive diseases: An update for the clinician

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Abstract

Anemia and iron deficiency are so common in digestive diseases that often are underestimated and undertreated. Our goal is to review from classification to treatment of the diverse types of anemias in different digestive diseases to update our knowledge on diagnosis and treatment. With the goal of improving the prognosis and quality of life of digestive diseases patients, we will review current transfusion, intravenous iron, and erythropoietin roles in the treatment of anemia.

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The human mind is a marvellous albeit complex tool. It is not easy to understand how it works^[1] with no exception for the clinician^[2]. Inflammatory bowel diseases (IBD) are complex, often difficult to manage, and anemia is so common around the world^[3] that perhaps even the most astute clinician simply cannot always see that specific tree in the forest^[4]. However, anemia is really important for patients, and we should not forget this. Since publication of the landmark article by Gasche^[5], a study^[6]

has shown the importance of anemia that should be actively looked for and treated. Anemia in IBD is a good example^[6], and we will dedicate our specific attention to it, but anemia can also be a key point in many different clinical scenarios of gastroenterology and hepatology. Therefore, in this short article, we will attempt to review several aspects we consider interesting for the practicing clinician. There are many possible approaches and we will take a look at different perspectives. Hematologists, gastroenterologists, hepatologists and even nephrologists will contribute to our task.

Anemia is both a simple word and a complex one. There are many different diseases that could be included in the World Health Organization definition of anemia (a patient has anemia if his or her blood hemoglobin level is below standard for age and sex). However, the simple final result can be due to the consequence of many different causes and mechanisms that can even overlap in the same patient and at the same time. Our first goal is to furnish our readers with an up-to-date classification of anemia. To do this work, we have chosen the hematologists' point of view.

Iron is not only the most abundant chemical element on Earth, but also a key element for life from very ancient ancestors. Life beings often compete for iron, a key to the control of redox reactions in many living organisms^[7]. Perhaps, due to evolutionary reasons, iron regulation is important in inflammation. In many digestive diseases, iron is a principal player because absorption, loss and regulation of iron metabolism, can all be affected in different diseases. Most likely, the paradigm is Crohn's disease^[8], in which malabsorption, inflammation and blood loss, all contribute to iron deficiency and iron deficiency anemia in some cases. The regulation of iron metabolism has been a very interesting topic in the last few years, and some new molecules have been developed. Hepcidin is a raising star, but it is not alone^[9]. The clinician should know the basics of these mechanisms to understand the treatment modalities, and so we have asked the experts to summarize this topic.

It is a bit counterintuitive, but luminal contents are out of our body, in a bacterial world (in fact all the earth is a bacterial world). To get iron in, it has to be absorbed as many other elements or substances. The role of malabsorption in anemia is a very interesting topic for gastroenterologists.

Anemia is a rather common problem in liver units as well. Patients with severe liver disease often have anemia and need specific treatment. Blood transfusion is common

(perhaps too common) in these patients. Anemia in patients with liver disease has interesting particularities, such as the role of portal hypertension, renal failure or antiviral drugs. Thus, a specific article has been devoted to anemia in liver disease.

The story of intravenous iron is a complex one^[10]. Some old preparations are difficult to manage and cause significant risks in patients. So, when new safer preparations^[11] that are easier to use appear, clinicians are simply fearful of using intravenous iron. However, with increasing experience in nephrology, oncology, gastroenterology, and gynecology, IV iron is becoming a standard treatment for patients at all ages and conditions^[12]. If we want this to be a real life standard, clinicians need clear rules, namely “who”, “when”, and “how” are the classic questions that are addressed in a specific article on IV iron.

Intravenous iron is not always enough to treat anemia since erythropoietin can be very useful if used judiciously. For this topic, we prefer the nephrologists' point of view because they have the most important experience with both sides: Dr. Jeckyll (the improvement in quality of life) and Mr. Hyde (mortality associated with a high hemoglobin level), who will tell us about their experience, which is very interesting with rather complex economic implications^[13].

Blood transfusion can be lifesaving in many clinical situations, and has been one of the greatest advances in medicine. However, blood transfusion is not a risk and/or cost-free, and may have been overused in many situations. Very important evidence from traumatology, surgical and intensive care units has been published in recent years^[14]. We should apply this update knowledge in our patients, following the most recent guidelines. The hematologists' point of view can be important for the gastroenterologist and the hepatologist.

Anemia, intravenous iron, blood transfusion, iron metabolism, *etc*, have been a few of the changing topics over the last few years. To help our patients, we still need

to know many things about this very old tree with many roots and branches. We have selected to update our knowledge on some of them, with the aim of helping our patients. In Darwin's year, it was always tempted to use the tree image, and so in a Freudian way to recognize him as the father of modern biology.

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