Gastrointestinal manifestations in patients with COVID-19 infection

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Abstract

We are currently facing a major threat to public health, with a significant impact on people's lives, destabilizing societies with a high mortality rate and weakening the economy worldwide. The disease was named coronavirus disease 2019 (COVID-19). As a new infectious disease, it is extremely important to discover its clinical characteristics, especially in the initial stage, in order to help detect and isolate patients earlier and to reduce the spread of the infection. We performed a systematic literature review based on an online search in the PubMed on Jun/13/2020, 19 records were analyzed, 13,954 patients were identified. This study aims to review and investigate the characteristics of gastrointestinal symptoms in patients with COVID-19, raise awareness of health professionals and facilitate early recognition as well as appropriate treatment, avoiding the spreading of the disease. In this study, we found that many of the hospitalized patients with the COVID-19 infection had at least one gastrointestinal symptom. Patients with gastrointestinal symptoms like abdominal pain, diarrhea, nausea, vomiting or anorexia deserve special attention, and it is extremely important to understand the nuances of clinical characteristics and prognosis among patients with and without these symptoms.

Keywords: COVID-19; Gastrointestinal symptoms; Abdominal pain; Diarrhea; Nausea; Vomiting; Anorexia

1. Introduction

We are currently facing a major threat to public health, with a significant impact on people's lives, destabilizing societies with a high mortality rate and weakening the economy worldwide. The disease was named coronavirus disease 2019 (COVID-19), by the World Health Organization (WHO) and the virus was designated SARS-CoV-2 by the International Virus Taxonomy Committee. Health systems face the challenge of demands that no one has ever seen before and there is an urgent need to characterize the range of clinical presentations of this disease, thus allowing the early identification, isolation and screening of affected patients. [1, 2, 3, 4, 5, 6, 7, 9, 10]

The most common symptoms at the beginning of COVID-19 are fever, cough, fatigue, myalgia, dyspnea and anosmia, while some patients also have gastrointestinal manifestations such as diarrhea, nausea, vomiting, abdominal pain and anorexia. Although symptoms may appear concomitantly, patients may also present only intestinal symptoms without the expected respiratory ones. [1, 3, 4, 5, 6, 7, 11, 12]

As a new infectious disease, it is extremely important to discover its clinical characteristics, especially in the initial stage, in order to help detect and isolate patients earlier and to reduce the spread of the infection [5, 8]

The objective of this study is to demonstrate the gastrointestinal presentations of COVID-19, drawing the attention of health professionals to their better identification, diagnosis, management and treatment.
2. Material and methods

We performed a systematic literature review based on an online search in the PubMed on Jun/13/2020. The following terms were used in the search engine to find matching articles: (COVID-19) AND ((abdominal pain) OR (abdominal presentation) OR (abdominal symptoms) OR (gastrointestinal symptoms) OR (gastrointestinal tract) OR (abdominal) OR (diarrhea) OR (nausea) OR (vomiting) OR (anorexia)).

Our initial search yielded 484 articles. All article titles and abstracts were read by at least one author, and selected if relevant. For the articles selected for full-text reading, at least two authors read the contents.

3. Results

Of the 484 articles found in our initial research, 430 articles were disregarded after reading the titles and 26 after reading the abstract. 28 articles were read by at least two authors, 09 of which were removed from the study. 19 records were elected for this review. (Figure 1).

![Selection diagram]

This study aims to review and investigate the characteristics of gastrointestinal symptoms in patients with COVID-19, raise awareness of health professionals and facilitate early recognition as well as appropriate treatment, avoiding the spreading of the disease.

19 records were analyzed, 13954 patients were identified, with median ages ranging from 43.7 to 65 years, Nobel et al [4]; Reed et al [20] and Liu et al [21] did not show their age variations. Eleven records identified patients with gastrointestinal symptoms such as anorexia, diarrhea, nausea, vomiting or abdominal pain. Nine studies presented data in percentages of patients with the presence of anorexia, eight presented data from patients with nausea or vomiting, seven records grouped nausea and vomiting as a single set of symptoms. Thirteen records represented their patient with the presence of abdominal pain. Interestingly, in all records the diarrhea symptom was analyzed. (Table 1).
Table 1 Gastrointestinal manifestations in patients with COVID-19 infection.

<table>
<thead>
<tr>
<th></th>
<th>Total Patients</th>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>GI Symptoms</th>
<th>Anorexia</th>
<th>Diarrhea</th>
<th>Nausea</th>
<th>Vomiting</th>
<th>Abdominal Pain</th>
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<tbody>
<tr>
<td>Zhang et al [13]</td>
<td>140</td>
<td>57 (25-87)*</td>
<td>71</td>
<td>69</td>
<td>55</td>
<td>17</td>
<td>18</td>
<td>24</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Guang et al [14]</td>
<td>1099</td>
<td>47 (35-58)*</td>
<td>640</td>
<td>459</td>
<td>41.8%</td>
<td>-</td>
<td>42</td>
<td>3.8%</td>
<td>55.5%</td>
<td>-</td>
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<tr>
<td>Chen et al [15]</td>
<td>99</td>
<td>55.5 (21-81)*</td>
<td>67</td>
<td>32</td>
<td>32.3%</td>
<td>-</td>
<td>2</td>
<td>2.0%</td>
<td>11%</td>
<td>-</td>
</tr>
<tr>
<td>Lin et al [7]</td>
<td>95</td>
<td>45.3 (+/-18.3)*</td>
<td>45</td>
<td>50</td>
<td>52.6%</td>
<td>58</td>
<td>61.1%</td>
<td>17</td>
<td>17.9%</td>
<td>23</td>
</tr>
<tr>
<td>Pan et al [6]</td>
<td>204</td>
<td>52.91 (+/-15.98)*</td>
<td>107</td>
<td>97</td>
<td>47.5%</td>
<td>103</td>
<td>50.5%</td>
<td>81</td>
<td>39.7%</td>
<td>35</td>
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<tr>
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<td>50 (36-65)*</td>
<td>115</td>
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<td>54.7%</td>
<td>66</td>
<td>26.0%</td>
<td>-</td>
<td>46</td>
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<tr>
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<td>55 (39-66.5)*</td>
<td>108</td>
<td>113</td>
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<td>-</td>
<td>80</td>
<td>36.2%</td>
<td>25</td>
<td>11.3%</td>
</tr>
<tr>
<td>Liam et al [18]</td>
<td>465</td>
<td>45 (5-88)*</td>
<td>243</td>
<td>222</td>
<td>47.7%</td>
<td>-</td>
<td>-</td>
<td>36</td>
<td>7.7%</td>
<td>22.4%</td>
</tr>
<tr>
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<td>279</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>56</td>
<td>20.1%</td>
<td>63</td>
<td>22.6%</td>
</tr>
<tr>
<td>Wang et al [19]</td>
<td>1012</td>
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<td>-</td>
<td>-</td>
<td>152</td>
<td>15.0%</td>
<td>36</td>
</tr>
<tr>
<td>Redd et al [20]</td>
<td>318</td>
<td>-</td>
<td>-</td>
<td>195</td>
<td>61.3%</td>
<td>110</td>
<td>34.6%</td>
<td>107</td>
<td>33.6%</td>
<td>84</td>
</tr>
<tr>
<td>Liu et al [21]</td>
<td>321</td>
<td>-</td>
<td>-</td>
<td>26</td>
<td>8.1%</td>
<td>-</td>
<td>23</td>
<td>7.2%</td>
<td>33</td>
<td>10.3%</td>
</tr>
<tr>
<td>Chen Q et all [22]</td>
<td>102</td>
<td>47.5 (+/-14.6)*</td>
<td>56</td>
<td>46</td>
<td>45.1%</td>
<td>-</td>
<td>36</td>
<td>35.3%</td>
<td>23</td>
<td>22.5%</td>
</tr>
<tr>
<td>Zheng et al [23]</td>
<td>1320</td>
<td>50 (40-57)*</td>
<td>579</td>
<td>741</td>
<td>56.1%</td>
<td>191</td>
<td>14.5%</td>
<td>62</td>
<td>4.7%</td>
<td>107</td>
</tr>
<tr>
<td>Shang et al [24]</td>
<td>307</td>
<td>46 (35-55)*</td>
<td>164</td>
<td>143</td>
<td>46.6%</td>
<td>-</td>
<td>111</td>
<td>36.2%</td>
<td>16</td>
<td>5.2%</td>
</tr>
<tr>
<td>Chen A et al [25]</td>
<td>101</td>
<td>48.32 (+/-14.34)*</td>
<td>41</td>
<td>60</td>
<td>59.4%</td>
<td>75</td>
<td>74.3%</td>
<td>54</td>
<td>53.5%</td>
<td>51</td>
</tr>
<tr>
<td>Díaz et al [26]</td>
<td>7213</td>
<td>40*</td>
<td>3606</td>
<td>3606</td>
<td>50.0%</td>
<td>-</td>
<td>-</td>
<td>526</td>
<td>7.3%</td>
<td>-</td>
</tr>
<tr>
<td>Achemos et al [27]</td>
<td>292</td>
<td>65 (+/-14.1)*</td>
<td>199</td>
<td>93</td>
<td>31.8%</td>
<td>69</td>
<td>23.6%</td>
<td>-</td>
<td>69</td>
<td>23.6%</td>
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<tr>
<td>Remes-Troche et al [28]</td>
<td>112</td>
<td>43.72 (+/-15)*</td>
<td>81</td>
<td>31</td>
<td>72.3%</td>
<td>23</td>
<td>20.5%</td>
<td>-</td>
<td>20</td>
<td>17.9%</td>
</tr>
</tbody>
</table>

Legend: * = median ˆ= standard deviation GI=Gastrointestinal Symptoms
4. Discussion

In this study, we found that many of the hospitalized patients with the COVID-19 infection had at least one gastrointestinal symptom. Diarrhea and abdominal pain were the most analyzed symptoms, followed by vomiting, nausea and anorexia, in that order. Most patients with COVID-19 present typical respiratory signs and symptoms. [6] However, it is noticed that gastrointestinal symptoms are a common complaint in patients with COVID-19, [6,25, 26] particularly associated with fever and respiratory symptoms. [6,13]

Digestive symptoms can occur in the absence of respiratory symptoms, but it is rare. [6;7] Some studies have shown that before the onset of respiratory symptoms, the first clinical manifestations in some patients were diarrhea, abdominal pain and nausea. [23]

This Patients with COVID-19 who have digestive symptoms take longer from symptoms to hospital admission than patients without digestive symptoms; this may reflect delayed diagnosis, because typical respiratory symptoms were not initially prevalent. [6] The probability of a positive test for COVID-19 was higher, associated with a 70% increase in the risk of positive tests, in patients with gastrointestinal symptoms such as diarrhea, nausea or vomiting. [4]

Patients without the classic case of fever associated with respiratory symptoms contribute to the potential risk of infection for front line health professionals and represent a greater challenge for the early diagnosis of patients with COVID-19. [23]

Patients with gastrointestinal symptoms deserve special attention, and it is extremely important to understand the nuances of clinical characteristics and prognosis among patients with and without these symptoms. [23] Our findings could be explained by a prevalent Gastrointestinal viral localization rather than respiratory. The gastrointestinal tropism of SARS-CoV2 has been demonstrated in a recent study that detected SARS-CoV2 more frequently in the stools of patients presenting with diarrhea. [27]

Pan et al [6] and Díaz et al [26] report that there are some reasons why COVID-19 can cause respiratory symptoms. Since SARS-CoV-2 is similar to SARS-CoV and may be able to invade the human body through Angiotensin-Converting Enzyme 2 (ACE-2). Liam et al [18] says: “SARS-CoV-2 is an enveloped virion with approximately 50200 nm diameter and a single positive sense Ribonucleic acid (RNA) genome. The envelope spike (s) protein is capable of mediating receptor binding and membrane fusion, vital for determining host tropism and transmission capacity. Since intestinal epithelial cells have a high ACE2 level which is the target of SARS-CoV-2, it is plausible that the virus could invade the gastrointestinal tract through this pathway.”

Associated with this, it is suggested that the virus can replicate in the intestinal epithelium [26]. SARS-CoV-2 indirectly or directly through a chain reaction of the inflammatory response and viremia can damage the digestive system, initially causing liver tissue damage. Another way is that the Virus itself causes disturbances in the intestinal flora and this alteration of the composition or function changes the intestinal immunological functions. The more severe the stage of the disease, the more gastrointestinal symptoms become more evident, perhaps due to greater viral replication. [6]

5. Conclusion

Patients without the classic case of fever associated with respiratory symptoms contribute to the potential risk of infection for front line health professionals and represent a greater challenge for the early diagnosis of patients with COVID-19.[23] Patients with gastrointestinal symptoms deserve special attention, and it is extremely important to understand the nuances of clinical characteristics and prognosis among patients with and without these symptoms. [23].

Compliance with ethical standards

Acknowledgments

To all health professionals who are at the front of the battle, taking care, treating and always comforting their Patients.

Disclosure of conflict of interest
The authors disclose no conflicts of interest.

References


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