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Research Article

Changes in Gastritis During the COVID-19 Pandemic: A Retrospective Comparative Study According to the Sydney Criteria

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ABSTRACT

Objective: This study aimed to evaluate whether the coronavirus disease-2019 (COVID-19) pandemic caused changes in the severity of gastritis, as assessed by the Sydney criteria, through a retrospective comparison of patients in the pre- and post-pandemic periods.

Methods: Pathology reports of 107 pre-pandemic patients until March 2019 and 96 post-pandemic patients until May 2023, who underwent upper gastrointestinal endoscopy for dyspeptic complaints and were diagnosed with gastritis were retrospectively analyzed. Gastritis severity was assessed according to the Sydney criteria. Percentages were calculated and compared.

Results: The pre-pandemic group included 62 women and 45 men (mean age 58.6 years). The post-pandemic group included 50 women and 46 men (mean age 57.6 years). No significant demographic differences were observed. According to the Sydney criteria, no permanent effect of COVID-19 on gastritis severity was identified.

Conclusion: Our study found no significant differences in gastritis severity between the periods before and after the COVID-19 pandemic. Larger prospective studies are required to further explore potential long-term effects.

Keywords: COVID, gastritis, Sydney criteria

INTRODUCTION

Gastritis is the term given to the inflammatory process that extends from the mucosa, the innermost of the histological layers of the stomach wall, to the serosa, the outermost layer. In this process, if neutrophils predominate, it is defined as acute gastritis; if mononuclear cells (lymphocytes, plasma cells, macrophages) are present together, it is defined as chronic gastritis. Another classification describes these processes as acute erosive gastritis and chronic atrophic gastritis, a terminology that is more commonly used in clinical practice.

In addition to improper nutrition, various chemical factors—such as the consumption of salicylate-containing medications—as well as certain bacterial infections or the toxins released during these infections, viral agents and their effects, and allergic reactions may lead to the development of gastritis. Another important factor is *Helicobacter pylori* (*H. pylori*) infection. In order to describe the histopathological reactions caused by *H. pylori* in the gastric mucosa and establish a common scientific language, the Sydney criteria were developed by pathology experts in 1990 and still remain significant today. In the updated 1994 version of the criteria, chronic inflammation, neutrophil activity, glandular atrophy (GA), intestinal metaplasia (IM), and *H. pylori* density are evaluated in a graded manner.

Cases of gastritis, which may occur together with many other diseases, have continued to be observed during the Coronavirus

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disease-2019 (COVID-19) pandemic as well. Gastritis is an inflammatory process of the gastric wall.[1-3] The Sydney criteria, developed in 1990 and updated in 1994, provide standardized assessment of gastritis histopathology.[4] The COVID-19 pandemic affected millions worldwide[5] and had physiological and emotional impacts, potentially influencing gastric pathology.[6] This study investigated whether there were changes in gastritis severity before and after the COVID-19 pandemic.[7,8]

MATERIAL AND METHODS

Our study is a retrospective observational study. Patients included in the study were those who presented to the General Surgery Department of Erzincan Binali Yıldırım University Mengücek Gazi Training and Research Hospital with complaints suggestive of gastric diseases in their anamnesis, and who were diagnosed with gastritis during upper gastrointestinal (GI) endoscopies performed by the General Surgery Department. The study included 107 patients from the pre-pandemic period up to March 2019 and 96 patients from the post-pandemic period up to May 2023 who underwent upper GI endoscopy due to dyspeptic complaints. Inclusion criteria for the study were patients who underwent endoscopy and biopsy and were diagnosed with gastritis histopathologically. The exclusion criterion was incomplete pathology data.

Biopsy results evaluated by the same pathologist were consistent with gastritis. Patients whose biopsy results differed from gastritis, particularly those indicating malignancy, were excluded from the study. Another criterion used in patient selection was timing. Patients who presented during the pandemic period were not included in the study. Based on the pandemic start date, patients who presented within the last year constitute the pre-pandemic group. Based on the pandemic end date, patients who presented within the last year constitute the post-pandemic group. Both groups were separately subjected to the Sydney Criteria. Developed by pathologists in 1990, the Sydney Criteria still retain their importance today. The criteria, updated in 1994, attempt to define the severity of gastritis by considering chronic inflammation, neutrophil activity, GA, IM, and Helicocacter pylori (H. Pylori) density in gastric biopsies. Accordingly, each parameter is expressed in four grades, numbered 0, 1, 2, and 3, representing increasing severity from 0 (no severity) to 3 (most severe), as determined by the pathologist. For this reason, another criterion applied in patient selection was that only patients whose biopsies were evaluated by the same pathologist were included in the study.

MAIN POINTS

- One of the most common stomach diseases is gastritis, and most studies in the literature related to the Coronavirus disease-2019 (COVID-19) pandemic focus on the pandemic period.
- This study was planned to investigate the post-pandemic effects.
- Our study observed that the COVID-19 pandemic did not affect the severity of gastritis according to the Sydney Criteria.

Ethical Approval

The study received ethical approval from the Non-Interventional Clinical Research Ethics Committee of Erzincan Binali Yıldırım University with decision number: 470098, dated 31.07.2025.

Statistical Analysis

Percentages were calculated for each Sydney criteria parameter. Group comparisons were performed using descriptive statistics.

The percentage method was used because it is easy and understandable. Patients in two main groups, pre-pandemic and post-pandemic, were classified.

And each group classified according to the Sydney criteria, with each parameter evaluated separately and gastritis severity increasing from 0 to 3. Percentage ratios were then calculated and compared.

RESULTS

Pre-pandemic group: 62 female, 45 male, mean age 58.6 years. Post-pandemic group: 50 females and 46 males (mean age 57.6 years). No significant demographic differences were noted.

The distribution of pre-COVID-19 gastritis patients, according to the Sydney criteria, is shown in Table 1.

Table 2 shows the distribution of patients with post-COVID-19 gastritis according to the Sydney criteria.

According to the Sydney criteria, in the Activation Criterion, 52.3% showed no cases before COVID-19, while the group with 3 positive cases (3.7%) was observed to be the least frequent group. Similarly, according to the Sydney criteria, in the post-COVID-19 period, 55.2% showed no cases, while the group with 3 positive cases (0%) was observed to be the least frequent group. Our study observed that the COVID-19 pandemic did not affect the Activation Criterion.

According to the Sydney criteria, in the Chronic Inflammation Criterion, in the pre-COVID-19 period, 49.5% showed the most cases in the group with 2 positive cases (53 patients), while the group with 0 positive cases (0.9%) was observed to be the least frequent group. According to the Sydney criteria for Chronic Inflammation, in the post-COVID-19 period, the highest percentage (39.6%) was found in the 2-positive group, while the 0-positive patient group had no patients, as in the pre-COVID-19 period. Our study observed that the COVID-19 pandemic did not affect the Chronic Inflammation Criterion.

According to the Sydney criteria for *H. pylori*, in the pre-COVID-19 period, the highest percentage (57.9%) was found in the 0-positive group, comprising 62 patients, while the 4-positive patient group had the lowest percentage (3.7%). According to the Sydney criteria for *H. pylori*, in the post-COVID-19 period, the highest percentage (70.8%) was found in the 0-positive group, comprising 68 patients, while the 5-positive patient group had the lowest percentage (5.2%). Our study observed that the COVID-19 pandemic did not affect the *H. pylori* Criterion.

Table 1. Distribution of Pre-COVID-19 Gastritis Patients According to the Sydney criteria (n=107)

Parameter	0	1	2	3	Total (%)
Activation	56 (52.3%)	35 (32.7%)	12 (11.2%)	4 (3.7%)	107 (100%)
Chronic inflammation	1 (0.9%)	33 (30.8%)	53 (49.5%)	20 (18.7%)	107 (100%)
H. pylori	62 (57.9%)	15 (14.0%)	26 (24.4%)	4 (3.7%)	107 (100%)
Metaplasia	86 (80.4%)	11 (10.3%)	8 (7.5%)	2 (1.9%)	107 (100%)
Atrophy	106 (99.1%)	0 (0.0%)	1 (0.9%)	0 (0.0%)	107 (100%)

H. pylori, Helicobacter pylori.

Table 2. Distribution of Post-COVID-19 Gastritis Patients According to the Sydney criteria (n=96)

Parameter	0	1	2	3	Total (%)
Activation	53 (55.2%)	33 (34.4%)	10 (10.4%)	0 (0.0%)	96 (100%)
Chronic inflammation	0 (0.0%)	28 (29.2%)	38 (39.6%)	30 (31.2%)	96 (100%)
H. pylori	68 (70.8%)	9 (9.4%)	14 (14.6%)	5 (5.2%)	96 (100%)
Metaplasia	76 (79.2%)	16 (16.7%)	4 (4.2%)	0 (0.0%)	96 (100%)
Atrophy	95 (99.0%)	1 (1.0%)	0 (0.0%)	0 (0.0%)	96 (100%)

H. pylori, Helicobacter pylori.

According to the Sydney criteria for metaplasia, in the pre-COVID-19 period, the highest percentage (80.3%) was found in the 0-positive group, comprising 62 patients, while the lowest percentage (2 patients) was observed in the 3-positive group.

According to the Sydney criteria for metaplasia, in the pre-COVID-19 period, the highest percentage (80.4%) was found in the 0-positive group, comprising 86 patients, while the lowest percentage (2 patients) was observed in the 3-positive group. According to the Sydney criteria for metaplasia, in the post-COVID-19 period, the highest percentage (79.2%) was found in the 0-positive group, comprising 76 patients, while no positive patients were observed in the 3-positive group.

Our study observed that the COVID-19 pandemic did not affect the metaplasia criterion.

According to the Sydney criteria, in the pre-COVID-19 period, the Atrophy Criterion was observed to be most prevalent in the 0-positive group (99%), with only 1 patient in the 2-positive group, and no patients in the 1-positive and 3-positive patient groups. Similarly, in the post-COVID-19 period, the Atrophy Criterion was observed to be most prevalent in the 0-positive group (99%), with only 1 patient in the 1-positive group, and no patients in the 2-positive and 3-positive patient groups. Our study observed that the COVID-19 pandemic did not affect the Atrophy Criterion.

DISCUSSION

The development of gastritis is multifactorial and includes diet, medications, infections, and emotional stress.[1-3] COVID-19 was suspected to affect the GI system.[8-10] Some studies reported that patients with GI symptoms had worse respiratory outcomes.[10,11] Others emphasized that COVID-19 may progress asymptomatically.[12,13]

It is noteworthy that a considerable portion of the existing literature was conducted exclusively during the pandemic period and, therefore, did not encompass both the pre- and post-pandemic intervals. In several of these studies, the most frequently reported GI symptoms were abdominal pain, nausea, and diarrhea.

In the present study, inclusion criteria were restricted to patients who underwent upper GI endoscopy specifically due to upper GI symptoms, from whom biopsy samples were obtained, and who subsequently received a histopathological diagnosis of gastritis. In this way, individuals who may have experienced the disease but had not yet received a formal diagnosis were inadvertently incorporated into the sample. The intention was to capture a broader population-level effect rather than an isolated individual impact. We consider that one potential explanation for the absence of significant differences between the pre-pandemic and post-pandemic groups according to the Sydney criteria may be the inclusion of such potentially undiagnosed individuals. Unlike previous studies.[8,9] our retrospective analysis comparing pre- and post-pandemic patients showed no significant changes in gastritis severity according to the Sydney criteria.[4]

Study Limitations

This study has several limitations. First, because the research was retrospective, data were obtained from archived endoscopy reports and pathology records. This carries the risk of incomplete documentation, measurement inconsistencies, and potential information bias. Although the Sydney classification was used to standardize gastritis assessment, interobserver variability could not be completely eliminated.

Second, due to restrictions applied during the COVID-19 pandemic, indications for endoscopy changed, with priority given to symptomatic or urgent cases. This may have caused selection bias within the sample and led to uncontrolled

differences in clinical characteristics between the pre-pandemic and post-pandemic groups.

Third, the study was conducted at a single center with a limited sample size. Therefore, the generalizability of the findings to other regions or diverse patient populations is restricted. Additionally, factors known to influence the severity of gastritis—such as *H. pylori* infection, non-steroidal anti-inflammatory drug use, proton pump inhibitor therapy, smoking, stress level, dietary habits, and comorbid conditions—could not be fully controlled.

Fourth, the pre-pandemic and post-pandemic periods were restricted to specific intervals. Thus, the dynamic and phase-dependent effects of the pandemic on gastritis could not be comprehensively evaluated. Furthermore, the relatively short observation period prevented the assessment of long-term morphological changes in the gastric mucosa.

Finally, due to the observational and retrospective design of the study, causal inferences regarding the impact of the COVID-19 pandemic on gastritis severity cannot be made. The results reflect associations and trends between the two periods rather than direct causality.

Future multicenter, prospective studies with larger sample sizes and more detailed control of lifestyle and infection-related variables will contribute to a clearer and more generalizable understanding of the pandemic's effect on gastritis.

CONCLUSION

According to the Sydney criteria, COVID-19 did not cause persistent changes in gastritis severity. Larger series are needed to confirm these findings.

Ethics

Ethics Committee Approval: Ethical approval obtained from Erzincan Binali Yıldırım University Non-Interventional Clinical Research Ethics Committee (decision no.: 470098, date: 31.07.2025.)

Informed Consent: Retrospective study. Permission was obtained from hospital management to collect study data from the Information Management System.

Footnotes

Author Contributions

Concept Design – O.Ç., F.K.Ç.; Data Collection or Processing – O.Ç., F.K.Ç.; Analysis or Interpretation – O.Ç., F.K.Ç.; Literature Review – O.Ç., F.K.Ç.; Writing, Reviewing and Editing – O.Ç., F.K.Ç.

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Conflict of Interest: The authors declare that they have no conflict of interest related to this study.

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REFERENCES

1. Dixon MF, Genta RM, Yardley JH, Correa P. Classification and grading of gastritis. The updated Sydney system. International Workshop on the Histopathology of Gastritis, Houston 1994. *Am J Surg Pathol*. 1996;20(10):1161-1168. [CrossRef]
2. Price AB. The Sydney system: histological division. *J Gastroenterol Hepatol*. 1991;6(3):209-222. [CrossRef]
3. Sipponen P, Price AB. The Sydney system for classification of gastritis 20 years ago. *J Gastroenterol Hepatol*. 2011;26 Suppl 1:31-34. [CrossRef]
4. Stolte M, Meining A. The updated Sydney system: classification and grading of gastritis as the basis of diagnosis and treatment. *Can J Gastroenterol*. 2001;15(9):591-598. [CrossRef]
5. World Health Organization. Coronavirus disease (COVID-19) pandemic. Geneva: WHO; 2020. [CrossRef]
6. Cheung KS, Hung IFN, Chan PPY, et al. Gastrointestinal manifestations of SARS-CoV-2 infection and virus load in fecal samples from a Hong Kong Cohort: systematic review and meta-analysis. *Gastroenterology*. 2020;159(1):81-95. [CrossRef]
7. Yong SJ. Long COVID or post-COVID-19 syndrome: putative pathophysiology, risk factors, and treatments. *Infect Dis (Lond)*. 2021;53(10):737-754. [CrossRef]
8. D'Amico F, Baumgart DC, Danese S, Peyrin-Biroulet L. Diarrhea during COVID-19 infection: pathogenesis, epidemiology, prevention, and management. *Clin Gastroenterol Hepatol*. 2020;18(8):1663-1672. [CrossRef]
9. Pan L, Mu M, Yang P, et al. Clinical characteristics of COVID-19 patients with digestive symptoms in Hubei, China: a descriptive, cross-sectional, multicenter study. *Am J Gastroenterol*. 2020;115(5):766-773. [CrossRef]
10. Jin X, Lian JS, Hu JH, et al. Epidemiological, clinical and virological characteristics of 74 cases of coronavirus-infected disease 2019 (COVID-19) with gastrointestinal symptoms. *Gut*. 2020;69(6):1002-1009. [CrossRef]
11. Han C, Duan C, Zhang S, et al. Digestive symptoms in COVID-19 patients with mild disease severity: clinical presentation, stool viral RNA testing, and outcomes. *Am J Gastroenterol*. 2020;115(6):916-923. [CrossRef]
12. Oran DP, Topol EJ. Prevalence of asymptomatic SARS-CoV-2 infection: a narrative review. *Ann Intern Med*. 2020;173(5):362-367. [CrossRef]
13. Byambasuren O, Cardona M, Bell K, Clark J, McLaws ML, Glasziou P. Estimating the extent of asymptomatic COVID-19 and its potential for community transmission: systematic review and meta-analysis. *J Assoc Med Microbiol Infect Dis Can*. 2020;5(4):223-234. [CrossRef]