Endoscopy

Decline in acute upper gastrointestinal bleeding during Covid-19 pandemic after lockdown in Austria

Andreas Schmiderer, Hubert Schwaighofer, Lukas Niederreiter, Christoph Profanter, Hartmut Steinle, Alexander Ziachehabi, Herbert Tilg.

Affiliations below.

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Conflict of Interest: The authors declare that they have no conflict of interest.

Abstract:
Background and study aims
COVID-19 disease has rapidly spread all over the world. The Austrian government has implemented a lockdown to contain further spread of this disease on March 16th. We investigated the effects of lockdown on acute upper gastrointestinal (GI) bleeding in Austria.

Patients and methods
We contacted 98 Austrian hospitals performing emergency endoscopies. The hospitals were asked to report upper GI endoscopies performed because of recent hematemesis, melena, or both and exhibiting endoscopically visible signs of bleeding. Investigated time points included three weeks before and after lockdown.

Results
61% of Austrian hospitals and importantly all major state hospitals responded. 575 upper GI bleedings occurred in the three weeks before and 341 after lockdown (40.7% reduction). When comparing the first and last calendar week of investigation we observed an almost 55% decline in nonvariceal bleeding events (calendar week 9 versus 14: 196 versus 89) whereas rates of variceal hemorrhage did not change (calendar week 9 versus 14: 17 versus 15).

Conclusions
National lockdown resulted in a dramatic decrease in upper gastrointestinal bleeding events.

Corresponding Author:
Herbert Tilg, Medical University of Innsbruck, Department of Internal Medicine I, Gastroenterology, Hepatology, Endocrinology & Metabolism, Innsbruck, Austria, herbert.tilg@i-med.ac.at

Affiliations:
Andreas Schmiderer, Medical University of Innsbruck, Department of Internal Medicine I, Gastroenterology, Hepatology, Endocrinology & Metabolism, Innsbruck, Austria
Hubert Schwaighofer, Medical University of Innsbruck, Department of Internal Medicine I, Gastroenterology, Hepatology, Endocrinology & Metabolism, Innsbruck, Austria
Lukas Niederreiter, Medical University of Innsbruck, Department of Internal Medicine I, Gastroenterology, Hepatology, Endocrinology & Metabolism, Innsbruck, Austria
[...]
Herbert Tilg, Medical University of Innsbruck, Department of Internal Medicine I, Gastroenterology, Hepatology, Endocrinology & Meta-
Brief Communication

Decline in acute upper gastrointestinal bleeding during Covid-19 pandemic after lockdown in Austria

Andreas Schmiderer¹, Hubert Schwaighofer¹, Lukas Niederreiter¹, Christoph Profanter², Hartmut Steinle¹, Alexander Ziachehabi³, Herbert Tilg¹

1. Department of Internal Medicine I, Gastroenterology, Hepatology, Endocrinology & Metabolism, Medical University Innsbruck, Austria
2. Department of Visceral, Transplant and Thoracic Surgery, Medical University Innsbruck, Austria
3. Department of Internal Medicine II, Kepler Universitätsklinikum, Linz, Austria

Correspondence to:
Herbert Tilg, M.D., Department of Internal Medicine I, Medical University Innsbruck, Innsbruck, Austria; Phone: +43 512 504 23539; E-mail: herbert.tilg@i-med.ac.at
Abstract

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Conclusions

National lockdown resulted in a dramatic decrease in upper gastrointestinal bleeding events. (175 words)
Introduction

Coronavirus disease 2019 (Covid-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has rapidly spread from China to all over the world. This disease includes typical symptoms such as fever, cough, myalgia, fatigue and pneumonia and in addition frequently gastrointestinal (GI) complaints such as diarrhea and neurological symptoms [1-3]. Covid-19 is accompanied by massive systemic inflammation and a so called “cytokine storm” with increases in acute phase reactants such as C-reactive protein, ferritin, and coagulopathy, all factors potentially promoting bleeding events especially also in the GI tract [4].

The rapid spread of this viral disease has challenged societies and resulted in strict quarantine and “lockdown” in many countries as only such measures might curb this disease [5-8]. The Austrian government initiated a nationwide lockdown on March 16th allowing people to leave homes only for specified reasons such as going to work, necessary purchases, assisting people and limited activities outside, alone or only accompanied by people living in the same household. Such a lockdown raised the immediate concern that some people may have been harmed by not having access to treatment. Indeed, the Austrian lockdown resulted in a 40% decline nationwide of acute coronary syndrome admissions to Austrian hospitals [9]. In the UK, visits to emergency departments in the first
week after lockdown went down to 49% including cardiac disorders and GI conditions [10].

Acute upper GI bleeding reflects one of the most common medical emergencies. Endoscopic findings in these patients exhibit peptic ulcer bleeding in about 60%, esophageal or gastric varices in around 10% and other findings on endoscopy such as Mallory-Weiss tears or bleeding reflux disease [11]. Incidence of acute upper GI bleeding in Western countries appears at 100 per 100,000 adults per year which means that in Austria with 8.8 million inhabitants we might expect 170 bleeding events/week. We were interested how the initiated lockdown has affected the rate of upper GI bleeding events and emergency endoscopies.

**Materials and Methods**

We contacted 98 Austrian hospitals with running emergency endoscopy facilities asking for numbers of upper GI endoscopies in upper GI bleeding emergencies. We included patients presenting with clinical evidence of acute upper GI bleeding such as hematemesis, melena or both and hemoglobin decline. Specifically, we were asking to report patients with either variceal or nonvariceal bleeding including an endoscopically visible lesion during upper GI endoscopy. Lockdown took place in Austria on March 16th and we collected data three weeks before and after lockdown (calendar weeks 9-14). All hospitals were contacted via email on April 9th. Data are given numerically counting number of performed
emergency endoscopies from calendar week 9-14. Data presentation and statistical analysis was performed using Graph Pad Prism V. 8.0. Where appropriate a paired 2-sided student's t-test was performed and statistical significance was assumed for a p value < 0.05.

Results

Of the 98 contacted public hospitals in Austria, 60 (61%) responded providing numbers of upper GI endoscopies on upper GI bleeding events. All Austrian University hospitals and all major state hospitals from the nine federal states reported their data. During the study period (calendar week 9 to 14; February 24th to April 5th) we observed a significant decline in upper GI endoscopies. Overall, 575 upper GI endoscopies were performed in the three weeks before lockdown versus 341 endoscopies after lockdown which means a 40.7% reduction of upper GI bleedings (p < 0.0001). When we compared calendar week 9 versus calendar week 14, we observed an even more pronounced reduction of upper GI endoscopies of 51.1%. Reduction rates were very impressive regarding non variceal bleeding (54.5%) whereas variceal bleeding events remained stable. Data on number of endoscopies in calendar weeks 9-14 are presented in Figure 1.
Discussion

The lockdown initiated by the Austrian Government led to a substantial reduction of various diseases including myocardial infarction [9]. We now report that upper GI bleeding events massively decreased after lockdown. Our expected data on frequencies of upper GI bleeding events in Austria suggest that a large majority of bleedings must have been reported by Austrian hospitals. This is also supported by the fact that all major state hospitals in Austria participated in this survey and mostly smaller hospitals did not respond.

The reasons behind the observed reduced upper GI bleeding rates remain currently unclear. One obvious concern is that people are frightened of going to emergency departments and public hospitals because of fear of enhanced risk acquiring SARS-CoV-2 infection. A decline in hospital admissions during Covid-19 pandemic has now been observed in many countries including China, Canada and several European countries [10]. Currently it cannot be answered whether people stay at home with various diseases which would require treatments or in contrast change in lifestyle during lockdown with social distancing results in less disease. As we did not have information on the severity of GI bleeding, we can only speculate whether a greater proportion of less severe bleeding events might have prevented people to attend hospitals for endoscopic procedures.

Stress factors have also to be taken into consideration. In our study as in other reports [11] nonvariceal bleeding accounts for ~90% of acute upper GI
hemorrhage. Stress factors mainly have been considered as cause of peptic ulcer disease in intensive care situations [12]. It might well be that modern medicine in the past years has rather ignored the fact that lifestyle and stress factors might contribute to upper GI disorders including peptic ulcer disease [13]. Importantly, our data show that especially nonvariceal bleeding events declined and this would fit into a hypothesis that stress factors promoting especially peptic ulcer disease could have also played a role. Variceal bleeding rates constituting less than 10% of acute upper GI bleeding were not affected by lockdown. Alcoholic liver disease is a leading cause of liver cirrhosis also in our country, and lockdown might result in increased consumption of alcohol. Importantly, alcohol consumption is a well known risk factor for variceal bleeding [14].

There remain some caveats which need attention. As a consequence of lockdown, endoscopy units have performed substantially reduced numbers of examinations focussing only on emergency and highly urgent procedures. We cannot rule out that Covid-19 pandemic has also influenced gastroenterologists in their decision to use endoscopy in the last weeks more defensively and less sick patients with suspicion of upper GI bleeding might not have undergone endoscopy [15]. Although many hospitals responded to our survey, a response bias could also have played a role as 39% of all Austrian hospitals, especially smaller ones did not respond. Despite these potential confounding factors our data clearly support the notion that initiated lockdown resulted in a dramatic decline in acute upper GI bleedings nationwide.
References


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Figure legend
Figure 1: Decline in acute upper gastrointestinal bleeding episodes in Austria consecutive to lockdown during Covid-19 pandemic. Numbers of upper GI endoscopies from calendar week 9 to calendar week 14 are reported. Lockdown took place beginning of calendar week 12. Absolute numbers of upper GI endoscopies/bleeding events are shown (open bars: variceal bleeding; grey bars: nonvariceal bleeding; black bars, total numbers of acute upper GI bleeding events per week in Austria).

Footnotes
Contributors: A.S. and HT wrote the paper. A.S., H.S., C.P., L.N. and H.S. and A.Z. collected the data.

Contributing hospitals
We are thankful to the Austrian hospitals contributing to this survey.
Contributing centers by federal state:

Burgenland:
KH BHB Eisenstadt – Department of Internal Medicine II (A. Püspök)
A.ö. KH Oberwart – Department of Surgery (T. Niernberger)

Carinthia:
Klinikum Klagenfurt am Wörthersee – Department of Internal Medicine and Gastroenterology IMuG (M. Peck-Radosavljevic)

A.ö. KH der Elisabethinen Klagenfurt – Department of Internal Medicine (HJ. Neumann) and Department of Surgery (C. Dreschl)

KH BHB St. Veit a.d. Glan – Department of Internal Medicine (F. Siebert, HP. Gröchenig)

A.ö. KH des Deutschen Ordens Friesach – Department of Internal Medicine (F. Waidmann)

Lower Austria:

University Hospital St. Pölten Lilienfeld – Department of Internal Medicine II (A. Maieron)

LK Neunkirchen – Department of Surgery (F. Längle)

LK Hollabrunn – Department of Surgery (F. Hoffer)

LK Horn – Department of Internal Medicine and Department of Surgery (E. Ulsperger, AV. Vezentan, G. Oppeck)

LK Hainburg a.d. Donau – Department of Internal Medicine and Department of Surgery (B. Hemedi)

LK Scheibbs – Department of Internal Medicine (K. Moyses)

LK Stockerau – Department of Internal Medicine (E. Hartl)

LK Mistelbach Gänserndorf – Department of Internal Medicine II (P. Mikosch)

LK Baden Mödling – Department of Surgery (S. Nakhai)
LKH Mistelbach Gänserndorf – Department of Internal Medicine II (P. Mikosch)
University Hospital Tulln – Department of Internal Medicine (H. Frank)

Salzburg:
University Hospital LKH Salzburg PMU – Department of Internal Medicine (A. Wagner) and Department of Surgery (K. Emmanuel, J. Holzinger, F. Singhartinger)
KH BHB Salzburg – Department of Internal Medicine (W. Miehsler, F. Hoppichler) and Department of Surgery (H. Weiss)
KH Oberndorf – Department of Internal Medicine (C. Datz)
KH Schwarzach – Department of Internal Medicine (A. Valentin)
KH Tamsweg – Department of Surgery (T. Szecsi)

Styria:
University Hospital Graz – Department of Internal Medicine (H. Schlager, P. Fickert)
KH Elisabethinen Graz - Department of Internal Medicine (V. Stepan, A. Riehs)
KH BHB Graz - Department of Surgery (F. Aigner) and Department of Internal Medicine II (G. Reicht)
KH BHB Graz Standort Marschallgasse – Department of Internal Medicine I (M. Schuhmacher)
KH Schladming – Department of Internal Medicine (G. Bischof)
LKH Hochsteiermark – Department of Surgery (R. Schrittwieser)
LKH Weststeiermark Voitsberg – Department of Internal Medicine II (J. Reich)
LKH Murtal – Department of Internal Medicine (W. Piber)
LKH Feldbach Fürstenfeld – Department of Internal Medicine (N. Watzinger)
Klinik Diakonissen Schladming – Department of Internal Medicine (G. Bischof)

Tyrol:
University Hospital Innsbruck – Department of Internal Medicine I (A. Schmiderer, H. Tilg) and Department of Surgery (C. Profanter)
LKH Hall – Department of Internal Medicine and Department of Surgery (I. Graziadei, O. Ludwiczek)
BKH Kufstein – Department of Internal Medicine (A. Zabernigg)
KH St. Vinzenz Zams – Department of Internal Medicine (E. Wöll)

Upper Austria:
Kepler University Hospital Linz – Department of Internal Medicine II (A. Ziachehabi)
Ordensklinikum BHS Linz – Department of Internal Medicine IV and Department of Surgery (R. Schöfl, R. Függer, F. Wewalka)
KH BHB Linz – Department of Internal Medicine (M. Clodi)
Klinikum Wels Gelsenkirchen – Department of Internal Medicine I (H. Hofer)
Klinikum Freistadt – Department of Internal Medicine (N. Fritsch)
KH BHS Ried im Innkreis – Department of Internal Medicine I (E. Rechberger)
Salzkammergutklinikum Vöcklabruck – Department of Internal Medicine (G. Scherfler)

Vienna:
University Hospital AKH Wien – Department of Gastroenterology and Hepatology (B. Tribl, M. Schöniger, M. Trauner)
Wilheminenspital Wien - Department of Internal Medicine IV (M. Gschwandtler, M. Schwarz, C. Schmidbauer)
KH BHS Wien – Department of Surgery (A. Klaus) and Department of Internal Medicine II (F. Pfeffel)
Mein Hanusch KH Wien – Department of Internal Medicine I (J. Zwerina, C. Oesterreicher)
KH BHB Wien – Department of Internal Medicine I (A. Ferlitsch)
Donauspital SMZ Ost – Department of Internal Medicine II (F. Böhme, C. Sebesta)
Klinikum Floridsdorf – Department of Internal Medicine and Department of Surgery (A. Walouschek, C. Sebesta)
Herz Jesu KH Wien – Department of Internal Medicine (A. Steffan, A. Zendeli)
Krankenanstalt Rudolfstiftung Wien – Department of Internal Medicine IV (C. Madl)
Kaiser Franz Josef Spital Wien – Center for Gastrointestinal Endoscopy (C. Madl)

Privatklinik Confraternität Wien – Department of Internal Medicine (M. Franz)

Franziskusspital Wien – Department of Internal Medicine (L. Enzenberger)

KH Hitzing Wien – Department of Internal Medicine I (K. König, L. Kramer)

KH St. Josef Wien – Department of Surgery (J. Zacherl)

Vorarlberg:

LKH Feldkirch – Department of Internal Medicine II (T. Winder)

KH Stadt Dornbirn – Department of Surgery (M. Zitt)

KH Bludenz – Department of Surgery (G. Rollinger)
Survey sent to 98 hospitals, 60 returned (61%).

- All upper GI-bleedings: 575 bleedings vs. 341 bleedings (40.7% decline).
- Variceal bleedings: 37 bleedings vs. 33 bleedings (no significant decline).

Lockdown (March 16th 2020).