

## Original Article

DOI: 10.22114/ajem.v0i0.97

## Effect of Implementation of Standard Clinical Practice Guideline on Management of Gastrointestinal Bleeding Patients in Emergency Department; a Cross-Sectional Study

Farhad Heydari<sup>1</sup>, Nasim Golestani<sup>2\*</sup>, Mehrdad Esmailian<sup>1</sup>

1. Emergency Medicine Research Center, Alzahra Hospital, Isfahan University of Medical Sciences, Isfahan, Iran.

2. Department of Emergency Medicine, Alzahra Hospital, Isfahan University of Medical Sciences, Isfahan, Iran.

\*Corresponding author: Nasim Golestani; Email: nasimg\_499@yahoo.com

### Abstract

**Introduction:** A clinical practice guideline (CPG) is developed with the aim of improving the quality of health care and reducing unnecessary interventions, hospitalization time, and related costs.

**Objective:** This study attempted to design a standard protocol for gastrointestinal bleeding (GIB) patients.

**Methods:** This was a cross-sectional study conducted during 2013 and 2014 in an educational medical center in Isfahan, Iran. A checklist containing questions about waiting time for the services, hospitalization time, and costs was completed for the GIB patients. After this primary data gathering, a CPG was designed, codified, underwent several revisions, and finally implemented. Thereafter, the checklist was completed by GIB patients and compared with the previous ones.

**Results:** Fifty patients in each of the two phases were included. The mean age and sex of the studied patients were not different.

The time from emergency departments (ED) arrival until the first visit ( $14 \pm 9.8$  Vs.  $19.4 \pm 13.4$  minutes;  $p = 0.03$ ), hospitalization ( $73.7 \pm 49.2$  Vs.  $116.2 \pm 7.2$  hours;  $p=0.003$ ) and costs ( $1.3 \pm 0.81$  Vs.  $3.68 \pm 3.51$  million rials;  $p < 0.001$ ) were significantly reduced following the CPG implementation. The time from admission until conducting endoscopy was not different in the two study periods ( $16.5 \pm 7.8$  Vs.  $23.9 \pm 24.5$  hours,  $p = 0.89$ ).

**Conclusion:** The implementation of the CPG for the management of GIB patients in the ED resulted in a reduction in the waiting time for the services and, further, reduction of hospitalization time and related costs.

**Key words:** Clinical protocols; Emergency department; Emergency service, hospital; Gastrointestinal hemorrhage

**Cite this article as:** Heydari F, Golestani N, Esmailian M. Management of Gastrointestinal Bleeding Patients in Emergency Department: The Effect of Implementation of Standard Clinical Practice Guideline. Adv J Emerg Med. 2018;2(4): e42.

### INTRODUCTION

There is a significant increase in referrals and admission rate to emergency departments (ED) in recent years (1-3). Consequently, the pressure on physicians and health system staff has also increased, forcing health policymakers to find better ways to provide health care services (4, 5). As a solution, in recent years, developing standard clinical practice guidelines (CPG) has been increasingly considered. These protocols help physicians make better decisions and provide rational management of the disease (6-8). It is likely that the development of CPG could increase the quality of health care by reducing inappropriate interventions and accelerating effective and valuable therapies.

CPG is a systematic and general approach that helps the system to take a meaningful decision about patients and properly guide them in certain

circumstances. The CPGs often refer to algorithms, clinical methods, and therapeutic policies, and there are certainly plenty of prospects to improve standard protocols in the future (9, 10). Recent research has shown that in countries that use CPGs, effective changes have been made to improve community health (11, 12). One of the most important effects of implementing standard CPGs is cost control. Designing standard CPGs is a policy that brings security margins to the health system (13). For the implementation of the protocol, a multidisciplinary panel should be designed to guide all target groups and clarify all the objectives of the CPG. Specific clinical conditions and goals should be covered, and the clinical reflections of interest should finally be clarified (14, 15).

One of the basic principles of the CPG is the choice of topic. It should be a common disease that has a

high cost of treatment and admission rate. Gastrointestinal bleeding (GIB) is a common disease with high morbidity and mortality, which imposes a high cost on the health care system (4, 5). Despite the advances in medical science in the last few decades, the mortality due to GIB has been 13%–14% (16-18). Therefore, this study aimed to develop and implement a standard CPG for the management of GIB patients in the ED of an educational medical center in Isfahan, Iran.

## METHODS

### *Study design*

This was a cross-sectional study conducted during 2013 and 2014 in the ED of Al-Zahra Hospital, Isfahan, Iran. The study protocol was approved by the ethics committee of Isfahan University of Medical Sciences (IR.MUI.REC.1392.3.331).

### *Study population*

The patients with GIB who were referred to this center during the study period were eligible. The inclusion criteria were patients older than 18 years of age who had hematemesis (or bloody nasogastric aspirate) or coffee ground vomiting, melena or rectorrhagia, as confirmed by the hospital staff. Also, patients who were discharged against medical advice during the hospitalization in the ED and rejected at least one of the doctor's orders were excluded.

### *CPG preparation*

The method of implementation of the project was to provide a 12-step protocol on the management and treatment of GIB patients based on standard clinical guidelines with the assistance and participation of expert professors of emergency medicine (EM), internal medicine, and subspecialists in gastroenterology, general surgery, colorectal surgery, and ICU physicians. Next, for one week, the protocol was implemented in 20 patients with GIB in the ED, and the necessary changes and existing shortcomings were eliminated. The protocol was designed as a flowchart and installed in different parts of the hospital. All the assistants involved in the treatment of these patients were educated.

### *Data gathering*

The study was carried out in three phases. In the first phase, after the selection of the subject and before the protocol implementation, the prepared checklist was completed for 50 GIB patients admitted during three months of 2013. Consecutive sampling was performed. The checklist included patients' demographic data, triage category, how the patient arrived at the hospital, patient's main complaint, history of

previous illness, first visit time, patient transfer to ward, endoscopy time, hospitalization time, and hospital costs. In the second phase after the protocol was drawn up, which lasted about a year, all the emergency staffs, interns, assistants, and specialists who were involved in the treatment of GIB patients in the ED were provided training in the protocol. In the third phase, the checklist was completed for 50 consecutive patients with GIB during 2014.

### *Definitions*

Triage was performed using Emergency Severity Index (ESI) version 4, which is a five-level ED triage algorithm that provides clinically relevant stratification of patients into five groups, from 1 (most urgent) to 5 (least urgent), on the basis of acuity and resource needs (19). Al-Zahra hospital ED has four parts, and depending on the patient's triage level, they were transferred to a part. The 1st level of ESI was transferred to ED1, the 2nd level to ED2, the 3rd level to ED3, and the 4th level to fast track.

### *Statistical analysis*

Data were analyzed using SPSS software version 20. Quantitative data were reported as mean and standard deviation, and qualitative data were reported as frequency and percentage. Since the distribution of data was not normal, the Mann-Whitney test was used to compare the time intervals and treatment costs. Comparison of demographic and clinical factors of patients was made with Chi-square and Fisher exact tests. In all analyzes,  $p < 0.05$  was considered as a significant level.

## RESULTS

In this study, 50 patients were enrolled in each study phase. The mean age of the group before and after the CPG implementation was  $61.3 \pm 19.5$  years (range 23–94 years) and  $53.5 \pm 21.6$  years (18–93 years), respectively ( $p = 0.09$ ). The demographic and basic clinical information of the studied patients is summarized in table 1. Based on the findings, there was no statistically significant difference in terms of sex, triage level, the method of referral, chief complaint, past medical history, and vital signs on arrival ( $p > 0.05$ ). There was no death in the two groups.

The assessed indexes before and after CPG implementation in this study are reported in table 2. The time interval from the arrival of the patient to the ED until the first visit by the resident of EM and also the time interval between the first visit to the internal medicine residents' visit was significantly lower after CPG implementation than

**Table 1:** Demographic and basic clinical information of studied patients in two study periods

Variables	Before CPG implementation	After CPG implementation	p
	Number (%)		
<b>Sex (%)</b>			
Man	38(76)	37(74)	0.82
Female	12(24)	13(26)	
<b>Triage Level (%)</b>			
1	3(6)	3(6)	0.26
2	38(76)	31(62)	
3	9(18)	16(32)	
<b>Type of referral (%)</b>			
The patient himself	30(60)	34(68)	0.10
from other centers	15(30)	10(20)	
EMS*	5(10)	3(6)	
From Prison	0(0)	3(6)	
<b>Chief complaint (%)</b>			
Melena	25(50)	27(54)	0.73
Rectorrhagia	8(16)	11(22)	
Hematemesis	13(26)	10(20)	
Coffee ground vomiting	11(22)	8(16)	
<b>History of disease (%)</b>			
Yes	39(78)	33(66)	0.18
No	11(22)	17(34)	
<b>Vital Signs(%)</b>			
Stable	45(90)	46(92)	>0.99
Unstable	5(10)	4(8)	

\*EMS: emergency medicine services

**Table 2:** Measured time periods before and after CPG implementation

Time period	Before CPG implementation	After CPG implementation	p
	Mean $\pm$ SD		
<b>Admission to EMP visit (minute)</b>	19.4 $\pm$ 13.4	14.0 $\pm$ 9.8	0.03
<b>EMP visit to internal medicine visit (minute)</b>	25.0 $\pm$ 9.6	14.6 $\pm$ 12.0	<0.01
<b>Admission to endoscopy (hours)</b>	23.9 $\pm$ 24.5	16.5 $\pm$ 7.8	0.89
<b>Duration of hospitalization (hours)</b>	116.2 $\pm$ 72.0	73.7 $\pm$ 49.2	0.003

\*EMP: emergency medicine physician

that before ( $p < 0.05$ ). The time interval between patient admission and endoscopy was  $23.9 \pm 24.5$  hours before CPG implementation and decreased to  $16.5 \pm 7.8$  hours thereafter, which did not show a statistically significant difference ( $p = 0.89$ ). The mean duration of hospitalization also significantly decreased after CPG implementation ( $p = 0.003$ ). Meanwhile, the average cost of hospitalization before CPG implementation was  $3.68 \pm 3.51$  million Iranian rials, whereas, after the implementation, it significantly decreased to  $1.3 \pm 0.8$  million Iranian rials ( $p < 0.001$ ).

## DISCUSSION

Following the CPG implementation in the current study, all the time intervals, except for the time interval from admission until performing endoscopy, were significantly reduced. This

indicates that the importance of the issue is clear to doctors and nurses, and also, since the instructions and how they were to be tracked and executed were specified and all services followed it, cases of wrong and repetitive and contradictory orders were much less.

Because the protocol was developed over a period of one year, the views of the colleagues of all involved services were considered, and the issues that were controversial were also discussed after a lot of discussions, the order set was agreed upon by all services. As a result, in addition to spending less time, it reduced the cost of treatment. The time from patient admission to endoscopy was reduced, although not significantly. Its probable cause was the lack of a change in the way of coordination between the internal medicine service and the gastroenterologist. Of course, reducing the time by

about 7 hours ultimately contributed to a reduction in the length of hospitalization. Hospital costs also decreased significantly due to faster endoscopy, a shorter hospital stay, and a reduction in unnecessary orders by the doctors.

GIB is a common cause of ED admission with a significant mortality rate (16-18). Management of patients with GIB is very important at the first hour of patient entry to an ED; so, proper prioritization and timely diagnostic and therapeutic measures in preserving the patient's life and preventing complications from injury is considered indisputable. If there is no protocol for the management of these patients, misplaced and repetitive measures will result in the loss of time for the necessary medical treatment and increased cost (5).

The results of this study showed that for patients requiring multi-service visitation and definitive diagnosis and treatment, a CPG approved by all services can save time and cost. In addition to being beneficial to the patient, due to the increasing overcrowding of emergencies, increased patient flow, and faster patient departures from an ED, that has an important role in the management of the ED, it increases the admission capacity in the ED. Also, the existence of order set for the common problems of the ED, such as GIB, leads to the confidence and calm of the physicians and nurses of the ED, resulting in better service to these and other patients.

## REFERENCES

1. Momeni M, Vahidi E, Seyedhosseini J, Jarchi A, Naderpour Z, Saeedi M. Emergency Overcrowding Impact on the Quality of Care of Patients Presenting with Acute Stroke. *Adv J Emerg Med*. 2018;2(1):e3.
2. Baratloo A, Maleki M. Iranian emergency department overcrowding. *J Emerg Practice Trauma*. 2015;1(2):39.
3. Esmaeili R, AGHILI SM, Sedaghat M, Afzalimoghaddam M. Causes of Prolonged Emergency Department Stay; a Cross-sectional Action Research. *Adv J Emerg Med*. 2018;2(2):e18.
4. Kredo T, Bernhardtsson S, Machingaidze S, Young T, Louw Q, Ochodo E, et al. Guide to clinical practice guidelines: the current state of play. *Int J Qual Health Care*. 2016;28(1):122-8.
5. Agrawal P, Kosowsky JM. Clinical practice guidelines in the emergency department. *Emerg Med Clin North Am*. 2009;27(4):555-67, vii.
6. Turner T, Misso M, Harris C, Green S. Development of evidence-based clinical practice guidelines (CPGs): comparing approaches. *Implement Sci*. 2008;3:45.
7. Hollon SD, Arian PA, Craske MG, Crawford KA, Kivlahan DR, Magnavita JJ, et al. Development of clinical practice guidelines. *Annu Rev Clin Psychol*. 2014;10:213-41.
8. Palda VA, Davis D, Goldman J. A guide to the Canadian Medical Association Handbook on Clinical Practice Guidelines. *CMAJ*. 2007;177(10):1221-6.
9. Heydari F, Maghami MH, Esmailian M, Zamani M. The Effect of Implementation of the Standard Clinical Practice Guideline (CPG) for Management of Multiple Trauma Patients Admitted to an Emergency Department. *Adv J Emerg Med*. 2018;2(1):e5.

## CONCLUSIONS

In the current study, the implementation of the CPG for the patients with GIB resulted in significant reduction of the waiting time for the visit of the physicians. Also, the hospitalization time and related costs decreased.

## ACKNOWLEDGEMENTS

The present article is the result of a thesis by an Emergency Medicine Resident, approved by the Deputy Director of the Research Department of the Faculty of Medicine at No. 392331. Thanks to the professors Dr. Shawahi and Dr. Minakari (Gastroenterologist), Dr. Abbasi (Anesthesiologist, ICU), Dr. Kolahdoozan (Surgeon, Thorax), and Dr. Bahrani (Surgeon, Colorectal) who helped us during the development of the protocol.

## AUTHORS' CONTRIBUTION

All the authors met the standards of authorship based on the recommendations of the International Committee of Medical Journal Editors.

## CONFLICT OF INTEREST

None declared.

## FUNDING

None declared.

10. Farnoosh L, Hossein-Nejad H, Beigmohammadi MT, Seyedhosseini-Davarani S. Preparation and Implementation of Intrahospital Transfer Protocol for Emergency Department Patients to Decrease Unexpected Events. *Adv J Emerg Med*. 2018;2(3):e29.
11. Fluck R, Kumwenda M. Renal Association Clinical Practice Guideline on vascular access for haemodialysis. *Nephron Clin Pract*. 2011;118 Suppl 1:c225-40.
12. Tay JC, Sule AA, Chew EK, Tey JS, Lau T, Lee S, et al. Ministry of Health Clinical Practice Guidelines: Hypertension. *Singapore Med J*. 2018;59(1):17-27.
13. Grimshaw JM, Thomas RE, MacLennan G, Fraser C, Ramsay CR, Vale L, et al. Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technol Assess*. 2004;8(6):iii-iv, 1-72.
14. Rosenfeld RM, Shiffman RN, Robertson P. Clinical Practice Guideline Development Manual, Third Edition: a quality-driven approach for translating evidence into action. *Otolaryngol Head Neck Surg*. 2013;148(1 Suppl):S1-55.
15. Rosenfeld RM, Shiffman RN. Clinical practice guideline development manual: a quality-driven approach for translating evidence into action. *Otolaryngol Head Neck Surg*. 2009;140(6 Suppl 1):S1-43.
16. Lichtenstein DR, Cash BD, Davila R, Baron TH, Adler DG, Anderson MA, et al. Role of endoscopy in the management of GERD. *Gastrointest Endosc*. 2007;66(2):219-24.
17. Muthusamy VR, Lightdale JR, Acosta RD, Chandrasekhara V, Chathadi KV, Eloubeidi MA, et al. The role of endoscopy in the management of GERD. *Gastrointest Endosc*. 2015;81(6):1305-10.
18. Krugmann J, Neumann H, Vieth M, Armstrong D. What is the role of endoscopy and oesophageal biopsies in the management of GERD? *Best Pract Res Clin Gastroenterol*. 2013;27(3):373-85.
19. Safari S, Rahmati F, Baratloo A, Motamedi M, Forouzanfar MM, Hashemi B, et al. Hospital and Pre-Hospital Triage Systems in Disaster and Normal Conditions; a Review Article. *Iranian J Emerg Med*. 2015;2(1):2-10.