Original Article

ระยะเวลาอยู่โรงพยาบาลของผู้ป่วยในหน่วยสังเกตอาการระยะสั้นของหน่วยบริการฉุกเฉินในโรงพยาบาลสงขลานครินทร์

กัณฐิกา   ไกรสวัสดิ์*
ประสิทธิ์   วุฒิสุทธิเมธาวี

Length of Stay of the Patients in the Short-Stay Observation Unit of the Emergency Department Service in Songklanagarind Hospital.
Kanthika Kraisawat, Prasit Wuthisuthimethawee
Department of Emergency Medicine, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand.
*E-mail: getjung004@hotmail.com

บทคัดย่อ:
วัตถุประสงค์: เพื่อพรรณนาระยะเวลาอยู่โรงพยาบาลของผู้ป่วยในหน่วยสังเกตอาการระยะสั้นของโรงพยาบาลโรงเรียนแพทย์แห่งหนึ่ง
วัสดุและวิธีการ: เป็นการทบทวนย้อนหลังผู้ป่วยรับไว้รักษาระหว่างวันที่ 1 สิงหาคม พ.ศ. 2550 ถึง 31 กรกฎาคม พ.ศ. 2551
ผลการศึกษา: มีผู้ป่วยจำนวน 1,715 ราย ในหน่วยสังเกตอาการระยะสั้นผู้ได้รับการส่งต่อมาจากหน่วยฉุกเฉินภาวะหลัก 3 อย่าง ได้แก่ การบาดเจ็บศีรษะเล็กน้อย ลำไส้ กระเพาะอาหารอักเสบ และฮีโมฟีเลีย ระยะเวลาอยู่โรงพยาบาลเฉลี่ยเท่ากับ 19 ชั่วโมง 47 นาที ส่วนใหญ่ (ร้อยละ 71.3) มีระยะเวลาอยู่โรงพยาบาล 24 ชั่วโมง หรือน้อยกว่า และเหล่านั้นเป็นสัตว์กัด ผลข้างเคียงจากการจัดการ และผู้ป่วยรอปรึกษา
สรุป: โดยเฉลี่ยการสังเกตอาการระยะสั้นไม่มากกว่า 24 ชั่วโมง และสะท้อนถึงภาวะไม่เล็กน้อยและไม่รุนแรง

คำสำคัญ: ระยะเวลาอยู่โรงพยาบาล, หน่วยสังเกตอาการ, ห้องฉุกเฉิน

Abstract:

Objective: To describe the length of stay of the patients in short-stay observation unit (SOU) of a medical school hospital.

Materials and methods: We undertook a retrospective data review of patients admitted to the SOU from 1 August 2007 to 31 July 2008.

Results: There were 1,715 patients of the SOU who were transferred from the emergency department. The three main conditions were minor head injury, gastroenteritis, and hemophilia with bleeding. The average length of stay (LOS) was 19 hours 47 minutes. The majority (71.3%) had a LOS of 24 hours or less. The factor related to a decreased LOS less than 24 hours were diagnosis of animal bites, adverse events during observation, and consultative cases. Seventy-six percent of the patients were discharged.

Conclusion: The average short-stay observation was not more than 24 hours which reflected the minor and non-serious conditions that were appropriate for observation.

Key words: emergency department, length of stay, short-stay observation unit

Introduction

Experience with observation medicine has been reported around the world.[1-11] The short-stay observation units (SOUs) have been shown to decrease lengths of hospital stay for patients with asthma,[12,13] chest pain,[14-16] and acute pyelonephritis[17] with decrease costs for patients with asthma,[12,13] abdominal trauma with negative diagnostic perito-neal lavage,[18] and a decrease of in-patient admis-sions of pediatric asthma patients.[12,13] The observa-tion units also have many advantages, such as the improvement of emergency physician skills, more accurate diagnoses, the reduction of over-crowding in the emergency department (ED) and the improvement of patient flow.[9,18-24]

The time limitation is the most important and should be carefully monitored and strictly enforced to succeed quality assurance. Many SOUs have a time limitation of 12 to 24 hours.[20] The mean length of stay (LOS) of the SOU patients in the Lateef et al.[6] study was in the range of 4-6 hours. Fung et al.[7] and Ross et al.[8] found the mean LOS of SOU patients to be 23.4 hours and 15.8 hours, respectively. The aim of this study was to describe the LOS of SOU patients in Songklanagarind Hospital.

Materials and methods

The clinical data of 1,715 patients admitted to SOU from 1 August 2007 to 31 July 2008 were retrospectively reviewed. The collected data that were analyzed included age, sex, vital signs, underlying disease, admission diagnosis, LOS, adverse events, and disposition.

The SOU admission criteria were age over 15 years, discharge prediction within 24 hours,

non-severe illness, hemodynamic stabilization, and not requiring intensive monitoring. Data related to outpatient management, chemotherapy, blood transfusion, and isolation requirement cases were excluded.

The statistical analysis was conducted using the Stata version 7 software. Continuous variables were analyzed and reported as means and medians, while discrete variables were reported as percentages. A multiple logistic regression analysis was performed to identify the factors influencing the LOS of SOU patients.

Results

During the study period there were a total of 53,480 ED patients and 1,715 patients (3.2%) were admitted to the SOU. Of the 1,715 patients 861 were male and 854 were female. The average age was 44.9 years, and one-fourth (24%) were 20 to 29 years old. Females were older than males (47.3 versus 42.7 years).

Nine hundred and eighteen patients (53.5%) had underlying diseases and the three most common conditions were hypertension, malignancy, and diabetes. The average LOS was 19 hours 47 minutes and ranged from 15 minutes to 94 hours. For most of the patients (71.3%) the LOS was 24 hours or less. The discharge rate was 75.7%. Ward and intensive care unit admission rates were 16.3% and 0.3%, respectively. The referral rate was 4.3% and 3.3% of the SOU patients were sent to the outpatient unit and one patient died in the SOU.

The five most common conditions were minor head injury (21.1%), gastroenteritis (11.0%),

hemophilia with bleeding (10.8%), electrolyte imbalance (6.8%), and fever of unknown origin (FOU) (6.5%) (Table 1).

The diagnoses with a LOS more than 24 hours were FOU (27 hours 41 minutes), hemophilia with bleeding (27 hours 32 minutes), and minor head injury (26 hours 40 minutes). Diagnoses with a discharge rate below 70% were headache (52.9%), hemophilia with bleeding (58.9%), musculoskeletal pain (60.6%), COPD/asthma (61.9%), abdominal pain (63.8%), FOU (65.8%), fatigue or malaise (69.0%), and other conditions (58.3%). According to the Brillman et al.[20] study indicated that 60-90% of patients can be expected to be discharged home without hospitalization after their observation period.

The number of observed patients who had adverse events was 70 patients (4.1%), which included unscheduled return ED visits within 48 hours (1.9%), hypotension (1.7%), patients who required intensive monitoring and invasive procedures (0.7%), one patient who died in the SOU, and 2 patients who died within 48 hours of ICU admission.

Multiple logistic regression analysis was performed to identify the factors related to the LOS of observed patients. The factors influencing the increased length of stay in the unit more than 24 hours were male, diagnosis of FOU, hemophilia with bleeding, and minor head injury. The factors related to a decreased length of stay less than 24 hours were diagnosis of animal bites, adverse events during observation and consultative cases (Table 2).

Table 1 Conditions of observed patients

Observed conditions	Number observed N=1,715			Mean duration of LOS (hours)	Discharge rate (%)	Adverse events n=70 (%)
	Male n=861 (100%)	Female n=854 (100%)	Total (%)			
Minor head injury	248 (28.8)	114 (13.3)	21.1	26.40±9.56	89.5	2 (0.6)
Gastroenteritis	69 (8.0)	120 (1.4)	11.0	15.38±12.17	86.8	13 (6.9)
Hemophilia with bleeding	126 (14.6)	59 (6.9)	10.8	27.32±20.10	58.9	6 (3.2)
Electrolyte imbalance	47 (5.5)	70 (8.2)	6.8	17.53±13.10	73.5	6 (5.1)
Fever of unknown origin (FOU)	57 (6.6)	54 (6.3)	6.5	27.41±21.38	65.8	9 (8.1)
Abdominal pain	36 (4.2)	58 (6.8)	5.5	16.36±12.32	63.8	5 (5.3)
Hypoglycemia & hyperglycemia	32 (3.7)	27 (3.2)	3.4	19.28±15.25	79.7	0 (0.0)
Nausea and vomiting	15 (1.7)	42 (4.9)	3.3	15.57±11.56	82.5	2 (3.5)
Urinary tract infection	11 (1.3)	43 (5.0)	3.1	17.10±11.21	79.6	1 (1.9)
Chest pain	33 (3.8)	17 (2.0)	2.9	7.32±3.46	70.0	3 (6.0)
Poisoning	12 (1.4)	33 (3.9)	2.6	14.55±7.46	80.0	1 (2.2)
Fatigue or malaise	22 (2.6)	20 (2.3)	2.4	13.26±12.10	69.0	1 (2.4)
Anaphylaxis	17 (2.0)	24 (2.8)	2.4	13.49±7.38	95.1	2 (4.9)
Dizziness or vertigo	8 (1.0)	31 (3.6)	2.3	11.44±9.57	76.9	3 (7.7)
Animal bite	16 (1.9)	21 (2.5)	2.2	11.23±6.52	83.8	0 (0.0)
Musculoskeletal pain	9 (1.0)	24 (2.8)	1.9	16.53±13.23	60.6	3 (9.1)
Syncope	12 (1.2)	17 (2.0)	1.7	13.27±9.45	79.3	1 (3.4)
Chronic obstructive lung disease (COPD)/asthma	18 (2.1)	3 (0.4)	1.2	18.22±9.47	61.9	3 (14.3)
Convulsion	14 (1.6)	4 (0.5)	1.0	17.50±12.07	72.2	2 (11.1)
Headache	4 (0.5)	13 (1.5)	1.0	16.35±13.58	52.9	1 (5.9)
Others (stroke, pneumonia, heart failure, etc.)	55 (6.4)	60 (7.0)	6.7	13.24±9.55	58.3	6 (5.2)

Table 2 Factors influencing LOS using multiple logistic regression analysis

The factors influencing LOS	Odds ratio	95% CI	P-value
Male	1.59	1.25–2.00	0.0001
Diagnosis of Hemophilia with bleeding	3.00	2.11–4.26	0.0000
Diagnosis of FOU	4.25	2.80–6.46	0.0000
Diagnosis of minor head injury	4.38	3.19–6.02	0.0000
Diagnosis of animal bite	0.12	0.02–0.88	0.0030
Adverse events during observation	0.41	0.20–0.81	0.0152
Consultative cases	0.67	0.49–0.92	0.0062

95% CI = 95% confidence interval

Discussion

Most of the observed patients with FOU, hemophilia with bleeding, and minor head injury had a LOS longer than 24 hours. The root cause of LOS was related to the treatment itself. Hemophilia patients with hemarthrosis requiring cryoprecipitate transfusion and intravenous analgesia usually improve after a few days. FOU patients treated with ceftriaxone once a day as an empirical antibiotic are observed for few days after treatment to rule out acute hemodynamic complications and await hemoculture results before discharge with further dosage of ceftriaxone. Fung et al.[7] reported patients with FOU had a longer LOS which is the same as our study. In the future, we believe guidelines should be prepared to optimize patient selection. Males had a longer LOS than females because 50.1% of the male patients in the SOU had minor head injury (28.8%), hemophilia with bleeding (14.6%), and FOU (6.6%). Most of the minor head injury patients were admitted to the SOU in the evening and the neurosurgeons observed neurological signs for at least 24 hours or extended the discharge time to the next morning for the patients' convenience.

Most of adverse events (84.3%), occurred within 24 hours after management in the SOU. After the occurrence of an adverse event the attending doctors may consult specialists in order to improve the medical treatment and refer (4.3%) the patient or admit (47.1%) them to hospital. We demonstrated that a LOS less than 24 hours has optimum efficacy as a cutoff point for most conditions.

The main adverse events were unscheduled return visits to the ED within 48 hours of discharge from the SOU and most of them came to the ED with the same conditions that had not improved before discharge. We should prepare discharge guidelines for observed patients for optimal patient disposition.

The overall average LOS was 19 hours 47 minutes which is below the efficacy cutoff point of 24 hours. The overall discharge rate was 75.7% which is higher than the efficacy cutoff point of 70%. Some conditions were not suitable for management in the SOU; for example, hemophilia with bleeding which needs ward admission for many days of management. Fung et al.[7] demonstrated that musculoskeletal pain such as back pain and COPD also had high hospital admission rates. In this study the patients with musculoskeletal pain, COPD or asthma, abdominal pain, headache, and FOU who did not improve during observation in the SOU were admitted to hospital for further work up and management.

We assumed that the SOU would reduce the overcrowding of the emergency room cases because before the SOU was established, hemophilia patients received cryoprecipitate at the ED and the minor head injury patients were also observed at the ED. Moreover, moderate illness cases that can be observed in SOU are rapidly discharged from the ED. The limitation of this study was the retrospective and descriptive review. We did not collect the ED overcrowding data, health care costs and hospital LOS to represent the effectiveness of the SOU.

Conclusion

The average short−stay was not more 24 hours, and reflected the minor and non−serious conditions that were appropriate for observation.

References

1. Lim SH, Anantharaman V. Emergency medicine in Singapore: past, present, and future. Ann Emerg Med 1999; 33: 338 − 43.

2. Clinical Epidemiology and Health Service Evaluation Unit. Short stay and observation units-final report. Melbourne: Melbourne Health; 2001.

3. Goodacre SW. Role of the short stay observation ward in accident and emergency departments in the United Kingdom. J Accid Emerg Med 1998; 15: 26 − 30.

4. Sinclair D, Green R. Emergency department observation unit: can it be funded through reduced inpatient admission? Ann Emerg Med 1998; 32: 670 − 5.

5. Mace SE, Graff L, Mikhail M, et al. A national survey of observation units in the United States. Am J Emerg Med 2003; 21: 529 − 33.

6. Lateef F, Anantharaman V. The short-stay emergency observation ward is here to stay. Am J Emerg Med 2000; 18: 629 − 34.

7. Fung HT, Tsui KL, Kam CW. An overview of an emergency department short stay ward in Hong Kong. Hong Kong J Emerg Med 2007; 14: 144 − 50.

8. Ross MA, Compton S, Richardson D, et al. The use and effectiveness of an emergency department observation unit for elderly patients. Ann Emerg Med 2003; 41: 668 − 77.

9. Sibly E, Wiskin CM, Holder RL, et al. Short stay emergency admissions to a West Midlands NHS Trust: a longitudinal descriptive study, 2002 2005. Emerg Med J 2007; 24: 553 − 7.

10. Cooke MW, Higgins J, Kidd P. Use of emergency observation and assessment wards: a systematic literature review. Emerg Med J 2003; 20: 138 − 42.

11. Dallos V, Mouzas GL. An evaluation of the functions of the short-stay observation ward in the accident and emergency department. Br Med J (Clin Res Ed) 1981; 282: 37 − 40.

12. Zwicke DL, Donohue JF, Wagner EH. Use of the emergency department observation unit in the treatment of acute asthma. Ann Emerg Med 1982; 11: 77 − 83.

13. Gouin S, Macarthur C, Parkin PC, et al. Effect of a pediatric observation unit on the rate of hospitalization for asthma. Ann Emerg Med 1997; 29: 218 − 22.

14. Gaspoz JM, Lee TH, Weinstein MC, et al. Cost-effectiveness of a new short-stay unit to "rule out" acute myocardial infarction in low risk patients. J Am Coll Cardiol 1994; 24: 1249 − 59.

15. Goodacre SW, Morris FM, Campbell S, et al. A prospective, observational study of a chest pain observation unit in a British hospital. Emerg Med J 2002; 19: 117 − 21.

16. Goodacre S, Nicholl J, Dixon S, et al. Randomised controlled trial and economic evaluation of a chest pain observation unit compared with routine care. BMJ 2004; 328: 254.

17. Israel RS, Lowenstein SR, Marx JA, et al. Management of acute pyelonephritis in an emergency department observation unit. Ann Emerg Med 1991; 20: 253 − 7.

18. Henneman PL, Marx JA, Cantrill SC, et al. The use of an emergency department observation unit in the management of abdominal trauma. Ann Emerg Med 1989; 18: 647 − 50.

19. Hassan TB. Clinical decision units in the emergency department: old concepts, new paradigms, and refined gate keeping. Emerg Med J 2003; 20: 123 − 5.

20. Brillman J, Mathers-Dunbar L, Graff L, et al. Management of observation units. American College of Emergency Physicians. Ann Emerg Med 1995; 25: 823 − 30.

21. Dresnick SJ. The future of the private practice of emergency medicine. Ann Emerg Med 1997; 30: 754 - 6.

22. Daly S, Campbell DA, Cameron PA. Short-stay units and observation medicine: a systematic review. Med J Aust 2003; 178: 559 - 63.

23. Crenshaw LA, Lindsell CJ, Storrow AB, et al. An evaluation of emergency physician selection of observation unit patients. Am J Emerg Med 2006; 24: 271 - 9.

24. Clinical Epidemiology and Health Service Evaluation Unit. Models of care to optimise acute length of stay: short stay/observation units (SOU), medical assessment and planning units (MAPU) and emergency medical units (EMU). Melbourne: Melbourne Health; 2004.