

Available online at www.sciencedirect.com**ScienceDirect**journal homepage: www.elsevier.com/locate/hlpt

Segmented regression analysis of emergency departments patient visits from Septicemia in Taiwan

I.-Shiang Tzeng^{a,b,c,*}, Kuo-Liong Chien^d, Yu-Kang Tu^{d,e},
Jau-Yuan Chen^f, Chau Yee Ng^g, Cheng-Yu Chien^h, Jih-Chang Chenⁱ,
Chung-Hsien Chaou^j, Giou-Teng Yiang^k

^aDepartment of Research, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, New Taipei City, Taiwan

^bDepartment of Statistics, National Taipei University, Taipei, Taiwan

^cDepartment of Risk Management and Insurance, Feng Chia University Taichung, Taiwan

^dInstitute of Epidemiology and Preventive Medicine, College of Public Health, National Taiwan University, Taipei, Taiwan

^eDepartment of Medical Research, National Taiwan University Hospital, Taipei, Taiwan

^fDepartment of Family Medicine, Chang Gung Memorial Hospital, Linkou, Taoyuan, Taiwan

^gDepartment of Dermatology, Drug Hypersensitivity Clinical and Research Center, Chang Gung Memorial Hospital, Taipei, Linkou and Keelung, Taiwan

^hDepartment of Emergency Medicine, Ton-Yen General Hospital, Hsinchu County, Taiwan

ⁱTaoyuan General Hospital, Ministry of Health and Welfare, Taoyuan, Taiwan

^jDepartment of Emergency Medicine, Chang-Gung Memorial Hospital, Linkou Branch, Taiwan

^kDepartment of Emergency Medicine, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, New Taipei, Taiwan

KEYWORDS

Septicemia;
Segmented regression
analysis;
Program evaluation;

Abstract

Background: The protocol for early goal-directed therapy (EGDT) is effective for improving both the costs and outcomes of septicemia treatment, including a significant reduction in case fatality. However, this complicated protocol may have a downside. Furthermore, the Joint Taiwan Critical Care Medicine Committee has launched a nationwide educational program after

Abbreviations: CVC, Central Venous Catheterization; CVP, Central Venous Pressure; ED, Emergency Department; EGDT, Early Goal-Directed Therapy; EMS, Emergency Medicine Service; GRHAC, Grading Responsible Hospitals for Acute Care; ICD-9-CM, International Classification of Diseases, 9th Revision, Clinical Modification; ICU, Intensive Care Units; MAP, Mean Arterial Pressure; MERS, Middle East Respiratory Syndrome; MOI, Ministry of the Interior; MOHW, Ministry of Health and Welfare; NHI, National Health Insurance; SARS, Severe Acute Respiratory Syndrome; ScvO₂, Central Venous Oxygen Saturation; SSC, Surviving Sepsis Campaign

*Corresponding author at: Department of Research, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, No.289, Jianguo Rd., Xindian Dist., New Taipei City, Taiwan.

E-mail address: istzeng@gmail.com (I.-S. Tzeng).

<https://doi.org/10.1016/j.hlpt.2018.01.010>

2211-8837/© 2018 Fellowship of Postgraduate Medicine. Published by Elsevier Ltd. All rights reserved.

Policy intervention;
Emergency care

the publication of the Surviving Sepsis Campaign (SSC) to improve the overall survival rate from septicemia in the emergency care system of Taiwan.

Objectives: To assess the impact of the EGDT protocol and SSC education programs on island-wide septicemia-related emergency department (ED) visits.

Methods: Segmented regression techniques were utilized to assess the differences in annual rates and changes in septicemia-related ED visits between 1998 and 2012. We considered annual incidence of two medical comorbidities as potential confounders: metastatic malignant neoplasms and malignant neoplasms of the lymphatic and hematopoietic tissues.

Results: The EGDT protocol was associated with decreased septicemia-related ED visits in 2002 (level change; $p < 0.001$), while the SSC education program led to a slight increase in septicemia-related ED visits in 2007 (slope change; $p < 0.001$). For the EGDT protocol, the number of patient visits decreased by 32.9% after the protocol was implemented in 2002 compared with the expected number without the intervention. For the SSC education program, the number of patient visits increased by 20.2% (compared with the predicted number) in 2007 after the education program was implemented.

Conclusions: The EGDT protocol and SSC education program were associated with significant immediate changes and lagged intervention effects on island-wide septicemia-related ED visits.

© 2018 Fellowship of Postgraduate Medicine. Published by Elsevier Ltd. All rights reserved.

Introduction

In recent years, emerging infectious septicemia has been one of the major causes of death in numerous developed countries [1-3]. Particularly, infectious diseases such as severe acute respiratory syndrome (SARS), flu, and Middle East respiratory syndrome (MERS) may be frequently accompanied by septicemia in the early course of illness. According to a report published by the Ministry of Health and Welfare (MOHW) in 2016, septicemia is the thirteenth leading cause of death in Taiwan. The incidence of septicemia has increased over the past few decades [4-7], and numerous studies have explored its pathogenesis [8,9].

The protocol for early goal-directed therapy (EGDT) has been shown to be effective for improving both the costs and outcomes of septicemia treatment, including a significant reduction in case fatality [10]. Usual care for septicemia lacks aggressive assessment and treatment, whereas the EGDT protocol has physicians employ intravenous fluids, vasopressors, packed red-cell transfusions, and dobutamine to achieve prespecified targets for central venous catheterization (CVC) to monitor central venous pressure (CVP) and central venous oxygen saturation (ScvO₂), which are monitored via central venous catheterization. Most intensive care units (ICUs) in Taiwan face such a situation. Most ICUs utilize a written form when carrying out EGDT, and the entire form must be completed [11].

However, the EGDT protocol is highly complicated, so there is controversy over whether it actually reduces case fatalities. Moreover, numerous clinical trials have been conducted to provide other evidence-based clinical practice protocols, such as the Surviving Sepsis Campaign (SSC) guidelines, to be delivered in education programs or different protocols control to improve patient outcomes [12-16]. These protocols or education programs aim to change physician behavior and guarantee that critically ill patients receive effective treatment [17-20]. The Joint

Taiwan Critical Care Medicine Committee has in fact launched a nationwide education program after the publication of the SSC [21]. This education program involves at least 10 h of training for participating intensivists.

To adequately evaluate the effect of the EGDT protocol and SSC education program on emergency department (ED) to be delivered in education programs patient visits due to septicemia, it is necessary to examine the underlying temporal trend in the incidence of septicemia over the past decade, as has been suggested by several studies conducted in Western developed countries [22,23]. Currently, little is known about the secular trend in ED visits due to septicemia in the general population of Taiwan. It is also necessary to consider the confounding risk factors that might have affected the incidence of septicemia during the same calendar period [24], such as annual incidence of metastatic malignant neoplasms and malignant neoplasms of the lymphatic and hematopoietic tissues [25].

Multiple studies have indicated that both the EGDT protocol and SSC education program are associated with survival [10,12-20]. Particularly, research in Asia has shown that implementation of EGDT and SSC were associated with improvements in outcome and survival rates. However, there has been little research on awareness of the diagnosis of patient visits for septicemia in the ED during implementation of EGDT and SSC, or how patient visits for septicemia are influenced by implementation of these programs. In the current study, we expected that EGDT protocol and SSC education program would increase awareness of the diagnosis of patient visits from septicemia in the ED, which in turn would increase the number of visits due to septicemia. We used segmented regression to determine the immediate impact of the EGDT protocol and SSC education program on the annual rates of septicemia-related ED visits by comparing the visit rates before EGDT implementation (1998-2001), during EGDT and SSC implementation (2002-2005), and after SSC implementation (2006-2012).

Download English Version:

<https://daneshyari.com/en/article/8733117>

Download Persian Version:

<https://daneshyari.com/article/8733117>

[Daneshyari.com](https://daneshyari.com)