นิพนธ์ต้นฉบับ • Original Article

การวิเคราะห์ปริมาณการใช้ยามอร์ฟีนในการระงับปวดในโรงพยาบาลศรีนครินทร์

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A Retrospective Analysis of Morphine Consumption for Pain Management at Srinagarind Hospital, Thailand

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หลักการและวัตถุประสงค์: อัตราการใช้ยามอร์ฟีนต่อประชากรเป็นดัชนีชี้วัดอย่างหนึ่งในการเทียบเคียงคุณภาพของการดูแลผู้ป่วยที่มีอาการปวดของแต่ละประเทศ แต่ในระดับโรงพยาบาลซึ่งเป็นหน่วยงานย่อย ไม่สามารถใช้ดัชนีชี้วัดต่อประชากรได้ ดัชนีชี้วัดคุณภาพการระงับปวดในระดับโรงพยาบาลนอกจากจะใช้ระดับความปวดของผู้ป่วยแล้ว การใช้ปริมาณมอร์ฟีนต่อปีหรือต่อผู้ป่วยอาจเป็นดัชนีคุณภาพได้เช่นกัน แต่ยังไม่เคยมีรายงานในโรงพยาบาลศรีนครินทร์มาก่อน วัตถุประสงค์ของการศึกษานี้ต้องการทราบปริมาณการใช้มอร์ฟีนต่อปีและต่อผู้ป่วยของโรงพยาบาลศรีนครินทร์

วิธีการศึกษา: เป็นการศึกษาเชิงพรรณนา โดยรวบรวมข้อมูลย้อนหลังในฐานข้อมูลของฝ่ายเภสัชกรรมของโรงพยาบาลและฐานข้อมูลของภาควิชาวิสัญญีวิทยา ระหว่าง พ.ศ. 2549 -2556 ข้อมูลสำคัญได้แก่ ยาระงับปวดในกลุ่ม opioids สี่ชนิดคือ morphine, pethidine, fentanyl และ methadone รวมทั้งจำนวนผู้ป่วยต่อปีทั้งผู้ป่วยนอกและผู้ป่วยในที่ได้รับยาดังกล่าว ปริมาณยาที่ได้รับทั้งหมดจะถูกแปลงเป็นมอร์ฟีนโดยเทียบเป็นหน่วยเดียวกันคือ จำนวนกรัมของมอร์ฟีนชนิดรับประทาน

ผลการศึกษา: พบปริมาณการใช้มอร์ฟีนในแต่ละปี เป็นเวลา 8 ปี เท่ากับ 14111.17, 7757.51, 8825.78, 13339.33, 11530.29, 14859.96, 11151.08, 16112 กรัม ตามลำดับ จำนวนครั้งที่ผู้ป่วยได้รับยาระงับปวดมอร์ฟีนต่อปี เท่ากับ 628453, 692628, 714763, 743732, 760150, 777507,

Background and Objectives: morphine consumption per capita is an indirect indicator commonly used for national evaluation of pain treatment quality. For small scale level like a hospital, direct pain assessment of patient is a practical indicator. However, the amount of yearly morphine used or a trend of morphine consumption per patient or per visit may be useful indicator for monitoring the quality of pain treatment but it is usually neglected. Objective of this study aimed to present the yearly consumption of morphine and morphine consumption per visit at Srinagarind Hospital.

Methods: Interesting data were retrospectively collected from pharmacy unit and department of Anesthesiology, Four types of opioids (morphine, pethidine, fentanyl and methadone) used during the period of 2006-2013 were analyzed and converted to be an oral morphine in gram equivalence. Numbers of patients received opioids per year during the study period were also recorded.

Results: The yearly morphine equivalence consumption during 2006-2013 were 14111.17, 7757.51, 8825.78, 13339.33, 11530.29, 14859.96, 11151.08, 16112 gram, respectively. The total number of patients received opioids were 628453, 692628, 714763, 743732, 760150, 777507, 823571, 874196 visit per year, respectively. The proportions of oral morphine per visit were 0.022, 0.011, 0.012, 0.017, 0.015, 0.019, 0.013, 0.018 gram, respectively.

Conclusion: The yearly morphine supply and the proportion of morphine consumption per visit during

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823571, 874196 ครั้งต่อปีตามลำดับ โดยสัดส่วนการได้รับมอร์ฟีนของผู้ป่วยต่อครั้งเท่ากับ 0.022, 0.011, 0.012, 0.017, 0.015, 0.019, 0.013, 0.018 กรัม ตามลำดับ

สรุป: ในช่วงแปดปีที่ผ่านมา ปริมาณการใช้มอร์ฟีนต่อปีของโรงพยาบาลและอัตราการได้รับยามอร์ฟีนของผู้ป่วยต่อครั้งไม่มีการเพิ่มขึ้น ดังนั้น การติดตามคุณภาพการดูแลผู้ป่วยที่มีอาการปวดนอกจากจะใช้ระดับความปวดของผู้ป่วยแล้ว ควรใช้อัตราการได้รับยามอร์ฟีนต่อครั้ง และปริมาณการใช้มอร์ฟีนต่อปีของโรงพยาบาล เป็นตัวชี้วัดร่วมด้วย

คำสำคัญ: มอร์ฟีน, อัตราการใช้มอร์ฟีน, คุณภาพการระงับปวด

2006-2013 were not increased. Therefore, morphine consumption per year or per visit in combined with pain scores may be useful indicators for monitoring the quality of pain treatment for a hospital level.

Keywords: morphine, consumption, quality of pain management

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Introduction

Opioids under-used has been concluded as a major cause of inadequate treatment either for acute or cancer pain[1,2]. In order to improve the quality of pain treatment, both care providers and pain patients expect to have more opioids supplied by the hospital or the government.

The Pain & Policy Studies Group (PPSG) University of Wisconsin-Madison, the research group that interesting in narcotics monitoring, regularly reports opioids consumption among countries includes Thailand[3]. In the PPSG website, data from Thailand were available from 1980 up to 2012 and only four opioids (morphine, methadone, pethidine and fentanyl) were reported. The report shows that the amounts of morphine and fentanyl consumption are rising whereas methadone and pethidine are decreasing. However, the total morphine equivalence (milligram per capita or per person) of Thailand in the year 2011 was 3.2996. When compares with the well-developed countries such as The United States of America, the morphine equivalence per capita in the same year is approximately 750 mg/capita which is about 250 times more than morphine consumption of Thailand. When compares to ASEAN countries like Viet Nam or Singapore, both countries have approximately two-fold (7.35-7.95 mg / capita) of morphine consumption more than Thailand[3]. However, morphine consumption in Thailand was almost double increased from 49 kg in 2006 to 80 kg in 2010 as reported by International Narcotic Control Board (INCB)[4].

Pain scores of patients are direct indicator for assessment of the quality of pain treatment. Pain scores for adult cancer patients admitted to our hospital, a university hospital, had been surveyed in 2004[5]. The overall prevalence of cancer pain within the first 24 hours of admission was 41.5 percent. In addition, the quality of post-operative pain treatment reported by the acute pain services, department of Anesthesiology in between 2004-2006 found that patients who experienced moderate degree of pain at rest was about 24-28 percent and severe degree of pain was 7-10 percent[6]. These evidences confirm that either cancer pain patients or post-operative pain patients are remaining under-treated in our setting. However, morphine consumption or availability in our hospital has never been reported. Therefore, the objective of this study aimed to analyze the yearly consumption of morphine and morphine consumption per visit in our hospital.

Materials and Methods

The study was approved by the Ethic Committee of Khon Kaen University [HE 571056]. We retrospectively collected computer based data from department of anesthesiology and pharmacy unit of the hospital during the period of January 2006 to December 2013. Interesting

data were number of patients received opioids and total amount of opioids (morphine, methadone, fentanyl and pethidine) used in each year. Four types of opioids were then converted to be the same unit, weight in grams, as oral morphine equivalence[7].

Results

The total number of visited-patients received opioids treatment in each year were 628453, 692628, 714763, 743732, 760150, 777507, 823571 and 874196 visits, respectively (Table 1, Fig 1). When divided patients into two groups, cancer group and post-operative group, according to types of the pain treatment (Table 1). Patients in the cancer group were increased from 14,926 in 2006 to 24,099 in 2013. Similarly, the number of post-operative patients in each year also increased, from 12,781 in 2006 to 18,485 in 2013.

The yearly morphine equivalence consumption was 14111.17, 7757.51, 8825.78, 13339.33, 11530.29, 14859.96, 11151.08, and 16112.00 grams, respectively (Fig 2). The proportion of morphine consumption per visit was quit different in each year 22, 11, 12, 17, 15, 19, 13 and 18 mg, respectively (Fig 3). Overall, the average of yearly morphine consumption was 12210.89 grams, and the average proportion of morphine consumption per visit was 15.875 milligrams.

Table 1 Number of patients who visit during 2006-2013

Year	Cancer patients	Post-operative patients	Total
2006	14,926	12,781	27,707
2007	15,921	13,872	29,793
2008	17,127	14,388	31,515
2009	17,560	14,449	32,009
2010	19,308	14,645	33,953
2011	20,740	16,425	37,165
2012	23,789	18,082	41,871
2013	24,099	18,485	42,584

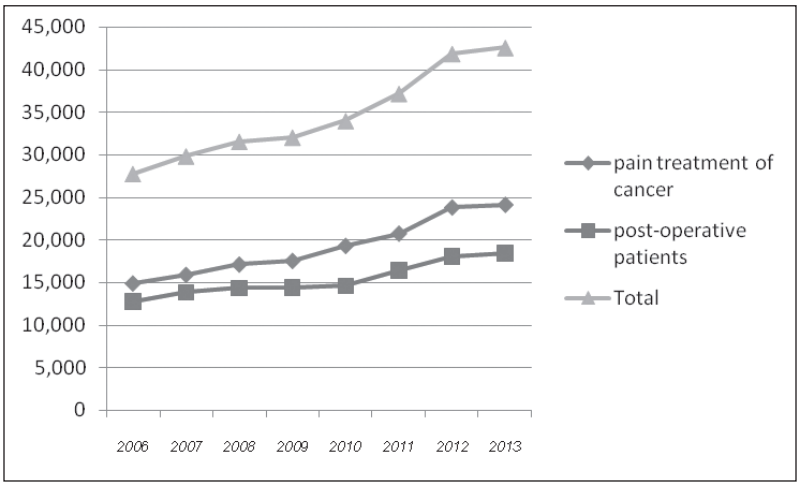

Figure 1 The total number of patients received opioids treatment per year.

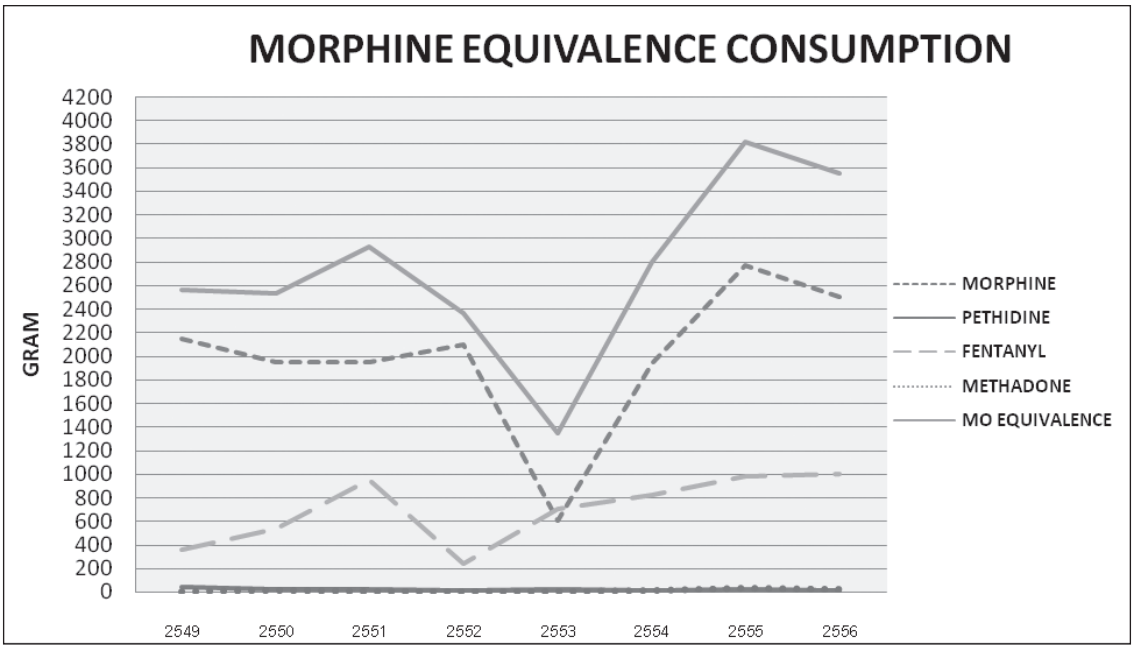

Figure 2 Four opioids and morphine equivalence consumption (gram) per year

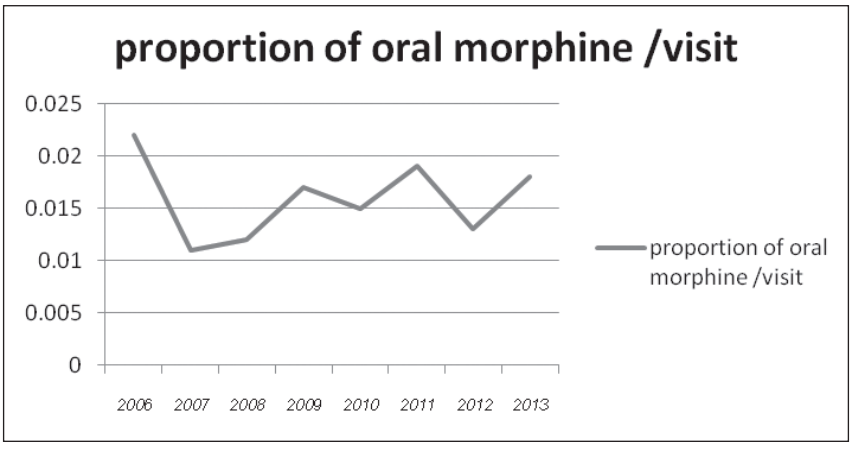

Figure 3 The proportion of oral morphine (gram) per visit

Discussion

This study demonstrated that the numbers of pain patients are increasing whereas morphine supplied is behind their need. The average proportion of morphine consumption per visit in this study was about 15 milligram and the number is not increased during 8 years of the study period. This is correlated well with the report of INCB that only 10% of global opioid was supplied to the developing countries which represent about 80% of the world's population[4]. Similar result was reported by PPSG University of Wisconsin-Madison[3] in 2011 that the number of morphine consumption per capita of Thailand was about 3.3 mg. It is contrast to the number of visited patients in this study either post-operative patients or cancer patients which is rapidly increased year by year, especially, new cancer cases are expected to reach approximately 125,000 by 2008 compared with 81,000 in 1999[8]. These data makes the authors believe that the quality of pain treatment in our setting either cancer pain or post-operative pain will not better or improve when compare to the previous surveyed at the beginning of this study by Vatanasapt[5]

and Wongswadiwat[6].

In the PPSG report, Thailand has only four types of opioids; morphine, pethidine, fentanyl and methadone but practically clinicians in Thailand as well as clinicians in our hospital also use tramadol and codeine for pain control. If, the authors decided to include tramadol and codeine into this study the amount of morphine equivalent per year will be increased. However, the amount of morphine consumption per year when compared to other countries in ASEAN is still low. Morphine consumption in Viet Nam and Singapore were double that in Thailand as mentioned earlier. In addition, morphine consumption per capita in Malaysia in 2011 was 36.7 mg then rapidly increased to 52.8 mg and 64.4 mg in 2012 and 2013, respectively[3].

Limited items of opioids for the treatment of choices in pain patients might be a result in poor quality of pain control in Thailand. In the United State of America and Singapore, the PPSG reports 6 types of opioids used; morphine, pethidine, fentanyl, methadone, oxycodone and hydromophone whereas in Thailand has only 4 items; morphine, pethidine, fentanyl, methadone.

The amount of pethidine and methadone are not increased during this study period. For pethidine, it is correspond with the global consumption of pethidine that declined from 15 tons in 1991 to less than 10 tons in 2010[4]. Pethidine expenditure in Taiwan from 2002 to 2007 was decreased about 30% as well[9]. A decrease in consumption of pethidine is because of the recommendations by regulatory authorities and health experts who are concerned about its toxicity and potential for abuse. For methadone, the use of methadone in Thailand is strictly reserved for the treatment of opioid addition. In our hospital, a number of opioid addition patients are very small. We sometimes used methadone for treatment of chronic pain patients but it is not a first choice analgesic that makes an overall methadone consumption quit low.

The opioids availability in Thailand is mainly control by the government policies for balancing between medical uses and prevents nonmedical use of such drugs. By increasing types of opioids and amount of each item, these will directly increased morphine consumption per capita. However, to revise or making the policy changes at this level is not easy and even the policies had been changed it does not ensure adequate provision of opioid drugs for medical and scientific purposes[10].

The policy of each hospital also affects the opioids availability, mostly depends on their own budget and priority of their problems facing. Since Thailand is a low income country, budget constraint is the most important problem of many hospitals. In this study the authors did not find out reasons that influenced the amount of opioids purchased per year. Shortage of opioids, some time, at the national drug control division (FDA) warehouse also affects the opioids availability of the hospital as well.

There are some limitations of this study, for example, opioids expenditure data that we did not well plan to collect them at the beginning. The amount of each drug reported should have detail of each preparation as well, for example, fentanyl has two types of preparation, transdermal form and injection form. The details of these data are not presented because we aim to look at the trend of overall consumption. Finally, the number of patients in this study is selected only for pain patients not the overall visited patients of the hospital which makes the number of morphine used per visit much more than usual.

Conclusion

The proportion of morphine consumption per visit during 2006-2013 was not increased. Therefore, morphine consumption per visit together with pain scores assessment may be useful indicators for monitoring the quality of pain treatment in a hospital level.

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