Cost Containment of a Reimbursement Restriction of Non-Essential Drugs Prescribing at Siriraj Hospital

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ABSTRACT

Objective: To study drug expenditure and the pattern of Non-Essential drug (NED) use after the restriction policy at a large University Hospital in Thailand.

Methods: The computerized data of the large University Hospital in Thailand was analyzed using a 'I control chart' with a statistically process-controlled method for the three highest oral drug expenditure groups of the hospital which included statins, proton pump inhibitor (PPIs), and non steroidal anti-inflammatory drugs (NSAIDs). The data of prior periods were collected before (December 2009-November 2010) and after (January 2011-August 2012) the implementation of the restricted policy of NED reimbursement was launched in December 2010.

Results: Both statins and PPIs expenditure were decreased more than 30% while NSAIDs was decreased about 25% after implementation of the policy. Drug expenditure cost was decreased about 177 million Baht per year in the three groups. The patterns of drug usage were changed from NED to Essential drug (ED) about 36%, 26% and 7% in statins, PPIs and NSAIDs groups, respectively.

Conclusion: The restriction of the NED prescribed policy was able to reduce the drug expenditure of the large university hospital. However the sustainable cost saving must be followed for the long term period.

Keywords: Non-essential drug, expenditive, control chart, policy

INTRODUCTION

In Thailand, health care expenditure is increasing and the factors which have affected the expenditure are the new technology, the changing pattern of diseases, antimicrobial resistance, emerging new diseases, and other factors. The government tries to reduce health care expenditure due to the increasing health care costs whereas the budget was inadequate. The largest part of health care expenditure was drug cost.[1] The total drug expenditure was rising from 35% (1993) to 46% (2009) of total health expenditure especially in the last 5 years which increased at a rate higher than health expense and economic growth.[2,3] From the rank of the first 20 high cost drugs in the four fiscal years (2008 to 2011) at a large university hospital, 14 drugs which were new and expensive drugs were non-essential drugs (NED). Some policies such as Direct Reimbursement System (DRS), and free-for-service reimbursement in which providers received payment for each service rendered from the payer (government) in the civil servants' medical benefit scheme (CSMBS), affected the increasing drug expenditure.[4] The study about the effect of the Direct Reimbursement System (DRS) on drug expenditures of cardiovascular outpatients under the civil servants' medical benefit scheme CSMBS at the Queen Sirikit Heart Center, Khon-Kaen University in four fiscal years (October 1, 2004 to September 30, 2008) found that DRS may affect the surge of non-essential drug prescription usage, with the NED/ED ratio substantially increased from 0.45 to 0.87.[5]

Most of these non-essential drugs (NED) are high cost drugs. Their usage was an important factor in high drug expenditure. Thailand is a developing country so management of the limited budget for all population is

crucial. To decrease drug expenditure, many national and hospital policies have been launched and cost containment strategies are displayed such as:[6]

1. Exclusion of specific drugs or drug classes from coverage (national and hospital levels) such as drugs for weight loss, infertility treatments, cosmetic, smoking cessation, vitamins and minerals.

2. Dispensing limits (quantity limits) for a prescription (hospital level) such as limiting the maximum drug cost or quantity of drug per prescription.

3. Drug utilization evaluation (national and hospital levels) such as a new drug or recently added to hospital formulary which are high cost or has a risk of irrational use.

4. Prior authorization requirements (hospital level) such as drugs recently added to formulary drug which are high cost or high risk of irrational use. The prescription is limited to specialists.

5. Mandatory generic substitution (hospital level) which is the policy to use generic drugs unless no generic drugs equivalent is available.

6. Step therapy or fail-first requirements (national and hospital levels)

Step therapy or fail-first requirements is drug activated by the government especially in CSMBS scheme patients because of the fast increasing rate of drug expenditure. Step therapy which is referred to a fail-first requirement drug, is a program where payment for a drug is restricted unless certain kinds of drug have been tried. For example the essential drug (ED) list concept is the basis for rational use of medication for those recommended first for therapy, thus a patient has to be treated with ED and if they are unsuccessful, the NED could be used and covered by the government. This policy has been widely used at a large university hospital to decrease drug expenditure and support rational drug use by the NED restricted reimbursement. This policy started in December 2010, and policy monitoring and evaluation have been necessary to demonstrate whether the policy influenced the drug expenditure. If so, the hospital should use this policy to control the drug expenditure. Thus the purposes of this study was to monitor and evaluate the influence of the policy "NED restricted reimbursement" in short and long term cost savings.

MATERIALS AND METHODS

This study focussed on the three highest expenditure drug groups with oral preparation: statins, proton pump inhibitor (PPIs), and non steroidal anti-inflammatory drugs (NSAIDs) in a large university hospital before (December 2009-November 2010) and after (January 2011-August 2012) implementation of the NED restricted reimbursement policy in December 2010. The availability of 25 drugs (63 items) which included NED and ED in 3 drug groups between 2009 and 2012 were analyzed. The study was divided into 2 parts.

The first part estimated the effects of the policy on the pattern of drug use between December 2009 and December 2011 which was the duration of 1 year before

and after implementation of the NED restricted reimbursement policy in December 2010. The pattern of drug usage in this part was categorized into 4 groups: 1) No history of receiving the same indication drugs at the hospital, 2) No change, 3) Change from NED to ED, 4) Change from NED to ED and / or NED classified by the following; 4.1 NED ➔ NED ➔ ED, 4.2 NED ➔ ED ➔ the same NED, and 4.3 NED ➔ ED ➔ another NED.

The second part analyzed the effects of policy on the drug expenditure with the 'I control chart' with a statistically process-controlled method for both NED and ED of each drug group which were classified into statins, PPIs, and NSAIDs during a defined time interval. For the control chart, the upper and lower control limits were set by convention at ±3 SD from the mean. Distribution of data points within these 3 SD limits was the expected variation which naturally occurred because of random causes inherent in the process on a regular basis. This was called 'common cause variation' in statistical process-control whereas special cause variation was defined by the incidence on the control chart of the patterns listed as follow:[7]

– One point more than 3 SD from center line.

– Nine points in a row on the same side of the center line.

– Six points in a row, all increasing or all decreasing.

– Fourteen points in a row, alternating up and down.

– Two out of three points more than 2 SD from the center line (the same side). This test evaluates the pattern of variation for small shifts in the process.

– Four out of five points more than 1 SD from center line (the same side).

– Fifteen points in a row within 1 SD of center line (either side).

– Eight points in a row more than 1 SD from center line (either side).

Drug expenditure in the study was obtained from the Hospital Inventory Database. This was calculated monthly and plotted in time order on the 'I control chart'. Statistical process-control was used as a method to evaluate the variation in the incidence. The study was approved by the hospital's Institutional Review Board (This study is a part of the topic "Cost containment of a reimbursement restriction of non-essential drugs prescribing at a large university hospital" IRB. No. 282/2554(EC4)).

RESULTS

For the prior-restriction policy for NED of statins, PPIs and NSAIDS 78,857 prescriptions, 53,612 prescriptions, and 113,195 prescriptions of patients were collected respectively. Table 1 has illustrated the quantity of patients who were changed from NED (22,047 patients, 22,337 patients and 56,420 patients of statins, PPIs and NSAIDs, respectively) to ED (7,966 patients, 5,807 patients, and 4,092 patients of statins, PPIs and NSAIDs, respectively).

After implementation of the policy, the majority (50%) of patients who used NED statins still used NED while the majority of patients who used NED PPIs (51%)

TABLE 1. Patterns of drug usage before and after the policy.

List	No. of prescriptions			No. of patients (%)		
	Statin	**PPIs**	**NSAIDs**	**Statin**	**PPIs**	**NSAIDs**
Before policy	78,857	53,612	113,195	22,047 (100)	22,337 (100)	56,420 (100)
1. No history*	8,004	21,006	60,349	3,087 (14)	11,398 (51.03)	36,873 (65.35)
2. No Change	38,440	15,066	38,471	10,087 (45.75)	4,501 (20.15)	13,996 (24.81)
3. Change from NED to ED	25,203	10,831	6,829	7,211 (32.71)	4,504 (20.16)	3,112 (5.52)
4.NED ➔ NED ➔ ED	3,565	4,691	2,919	755 (3.42)	1,303 (5.83)	980 (1.74)
5. NED ➔ ED ➔ the same NED	2,507	1,232	1,736	632 (2.87)	350 (1.57)	567 (1.00)
6. NED ➔ ED ➔ another NED	1,138	786	2,891	275 (1.25)	281 (1.26)	892 (1.58)

* No history of receiving the same drug group at the hospital

and NED NSAIDs (65%) showed no history of receiving the same indication drugs at the hospital as shown in Fig 1. The patients who still used NED were divided into 1) No Change of medication both before and after the implementation (46%, 20%, and 25% of statins, PPIs and NSAIDs, respectively), 2) NED ➔ ED ➔ the same NED (3%, 2%, and 1% of statins, PPIs and NSAIDs, respectively), and 3) NED ➔ ED ➔ another NED (1%, 1%, and 2% of statins, PPIs and NSAIDs, respectively) as shown in Fig1A, 1B, and 1C.

The NED expenditure was significantly decreased after implementation of the policy as show, in Fig 2.

while ED expenditure was increased as showed in Fig 3. The drug expenditures of NED and ED were plotted in time order monthly from December 2009 to August 2012 on the 'I control chart' shown in Fig 2 and Fig 3. The mean (average) expenditure on drugs during the 32 months period were 18,263,485 baht, 10,851,396 baht, 5,513,905 baht for statins, PPIs, and NSAIDs, respectively. This was indicated by the solid, horizontal center line on the charts. After the implementation of the policy in December 2010, the trends of NED expenditure in all groups were decreased. For example, the data points of NED statins and PPIs in May 2011 (Figure 2A, 2B) were marked as
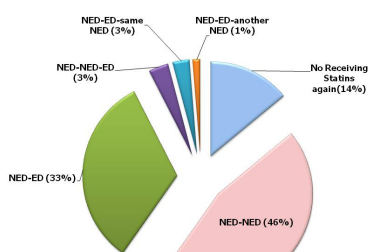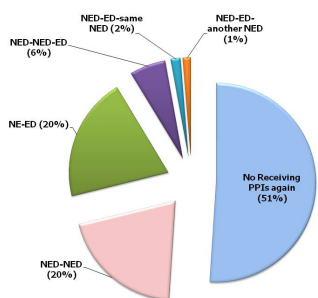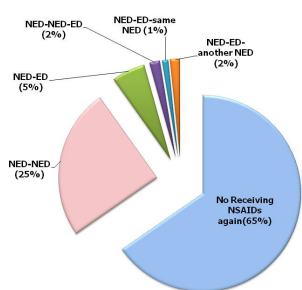

Figure 1A. Statins

Figure 1B. PPIs

Figure 1C. NSAIDs

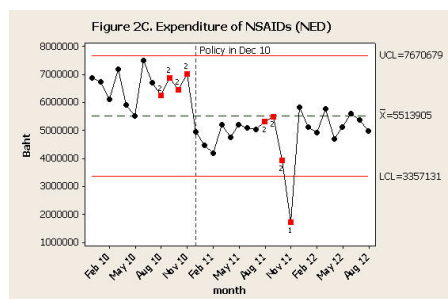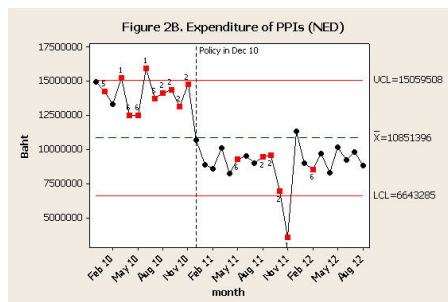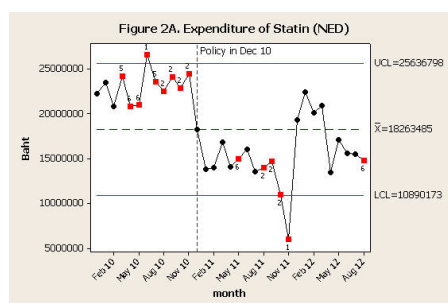**Fig 1.** The pattern of drug usage after the implementation of the restriction policy.

Fig 2. The Control Charts of NED expenditure from December 2009 to August 2012. The dotted line indicates the starting point of the policy. UCL=Upper control limit, LCL = Lower control limit.

Fig 3. The Control Charts of ED expenditure from December 2009 to August 2012. The dotted line indicates the starting point of the policy. UCL=Upper control limit, LCL = Lower control limit.
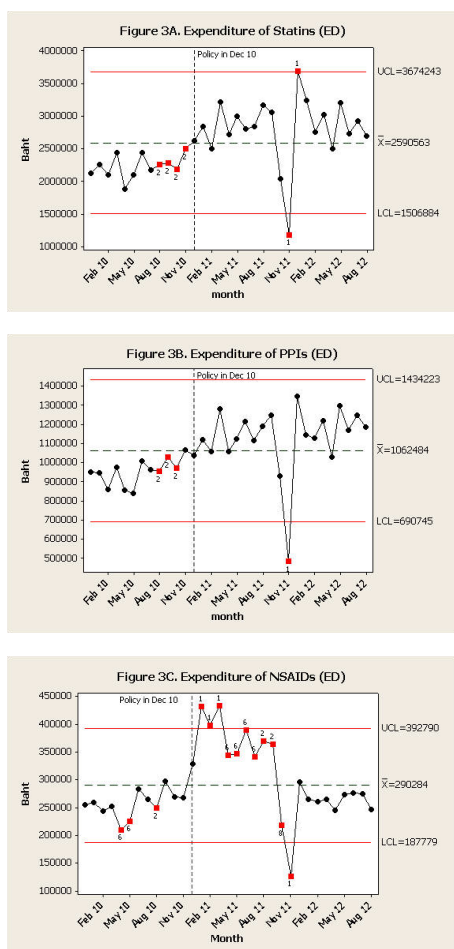
special cases because four out of five points were more than 1 SD from the center line (at the same side), the point in August and September 2011 on the control chart in Fig 2A, 2B, 2C were marked as special cases because 9 points in a row were on the same side of the center line. These significant shifts indicated the results of the policy. For ED, the expenditure was increased except during flooding crisis period when all drug expenditures were down (the point in November 2011 on the control chart in Fig 2 and Fig 3 were marked as special cases because one point was more than 3-SD from the center line). However, the drug expenditure was highly increased during 1-3 months after the flooding especially in the statins group, then the drug expenditure of NEDs in all drug groups were decreased which was similar to the first period of implementation of the policy.

DISCUSSION

The trend of increasing overall drug expenditure was greatly affected by the increased usage of high cost drugs.[8] Many strategies for cost containment were used at a large university hospital such as exclusion of specific drugs or drug classes from coverage, dispensing limitation, drug utilization evaluation, prior authorization requirement, mandatory generic substitution, and step therapy or fail-first requirement. This NED restricted reimbursement is similar to the step therapy or fail-first requirement. The previous study which looked at strategies for managing Cox-2 drugs (Celebrex, in particular) showed that the most effective utilization management approach (in terms of percentage savings) was step therapy, the second most effective was prior authorization, and the third was a form of reference price and the least effective was three-tier copayment.[9] This study demonstrated that the increased usage of ED and decreased usage of NED might be affected by the NED restricted reimbursement. The overall expenditure of the three drug groups after implementation of the policy (between January 2011 and August 2012) for NED was decreased while ED was increased. However, the sustainable cost saving must be followed for the long term period. Other tools to control the drug expenditure and drug usage must be applied if this policy is not valid such as the protocol or criteria for some group of drugs usage or diseases must be set up for the rational drug use and cost saving.

CONCLUSION

The restriction of NED prescribing was able to reduce the drug expenditure of a large university hospital. However the sustainable cost saving must be followed for the long term period and the hospital needs to closely monitor the drug expenditure and provide the tools to keep the current situation up to date.

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