Analysis On The Affecting Factors Of The Use Of Essential Medicines In Beijing’s Community Health Institutions

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ABSTRACT

Objective: To examine the use of essential medicines in Beijing’s community health institutions, and analyze problems and influencing factors in the stock and use of essential medicines so that we can provide references and suggestions for the reform of the Essential Medicine System. Methods: An investigation was made to analyze the stock of essential medicines, the average expenses of drugs per visit in community health service institutions and the problems in implementing the Essential Medicine System. Results and Conclusion: There were average 381 species of essential medicines in these community health institutions, accounting for 54.5% of the Essential Medicine List in Beijing. The average expenses of drugs per outpatient visit increased year by year from 2009 to 2015. Both the list and supply of essential medicines could not meet the clinical need of patients at community health centers. First-aid and low-priced essential medicines were out of stock. Some patients were doubtful about the brands and quality of essential medicines. More commonly-used drugs for chronic diseases should be added to the essential medicines directory and drug centralized bidding mechanism should be improved as well. Good formulation of policies and joint efforts of all parties are necessities for the essential medicine system to improve medical quality and serve the public better.

Keywords: essential medicine; community health institutions; application status; analysis

1. INTRODUCTION

Beijing’s health resources are in the leading position in China, but the use of medical resources at all levels of hospitals is seriously unbalanced and it is difficult to be improved. This situation is closely relevant to the medical resource allocation and the irrational use of these resources. The core problems are the lack of hierarchical diagnosis system and unbooked hospital visits. The establishment and implementing of hierarchical diagnosis system could alleviate the excessively centralized use of medical resources and guide the public to achieve medical treatment more orderly.

Therefore, in recent years, the government takes the development of community health service as a breakthrough for the reform of urban health system. Community health institutions provide basic health care activities such as disease prevention, health care, rehabilitation and health promotion. Community health service has advantages in cutting medical expenses and reducing the burden of patients. Together with the launch of the new national list of essential medicines as an important key and implementing drug sales “zero-slip” policy, we can solve the problem of “difficulty and high costs of getting medical service”.

In March 2010, 324 community health service centers in Beijing began to implement the national essential medicine system. Essential medicines are on sale in all these centers which must be the first choice and reach a certain proportion of use. This policy had deep influences on community health centers that provide health service to the public.
This study aimed to explore the influencing factors of the use of essential medicines in community health institutions so that we could provide references for essential medicine policies. At the same time, we analyzed the problems in the stock and use of essential medicines to provide suggestions for community health institutions so that they could carry out the policy efficiently.

The results of this study would make essential medicine list meet the clinical need better, such as cutting drug costs and improving the quality of health care, increasing patient’s consultation rate so that community health resources could be utilized.

2. STUDY DESIGN

2.1 MATERIALS
In this study, 12 community health service centers with relatively more outpatient visits from Beijing’s six urban districts were chosen during August 2017. The condition of supply was studied in these health centers. Statistics from Beijing Municipal Health Bureau were collected before and after the implementation of the essential medicine system (2009–2015) and they were summarized. Questionnaires on the use of essential medicines were dispensed to medical staff in the above 12 community health centers.

Qualitative analysis was conducted through semi-structured interviews. Two directors of community health service centers, seven directors of pharmacies and eight pharmacists who knew the circulation of drugs well were interviewed to discover the problems relating to essential medicines.

2.2 DATA ANALYSIS METHODS
Excel 2013 was used for quantitative data statistics and analysis, and qualitative data were recorded into documents on the spot and category analysis was applied.

3. RESULT AND ANALYSIS

3.1 STATUS OF SPECIES OF THE ESSENTIAL MEDICINES LIST
The 2012 edition of National Essential Medicines List (primary health institutions section) contained 520 species of essential medicines. In addition, another 179 species that were not in the National Essential Medicines List originally were added to the list by Beijing Municipal Bureau of Health (for community health institutions’ use) and they were put into Beijing community drug procurement catalog. Therefore, at present Beijing essential medicines list contains 699 species, including 379 western drugs and 320 Chinese medicines. The species and quantity of essential medicines in the community health service centers can reflect directly the adequacy of the essential medicine’s supply, so it is necessary to find out the essential medicines in stock in community health service centers.
The field survey in August 2017 showed the stock of essential medicines accounted for 58.7% of the total number of drugs (649) in the institutions. This demonstrated that community health institutions purchased non-essential medicines for outpatient service to meet the needs of patients. Essential western medicines in stock in the institutions accounted for 53.8% and 54.1% of traditional Chinese medicines on the list. These low percentages showed that some drug types in the essential medicines directory were rarely used by community health institutions.

### 3.2 ANALYSIS OF THE AVERAGE DRUG COST FOR OUTPATIENT

The effect of implementing essential medicines system should also be evaluated with the changes of the total medical costs and drug expenses. Statistics of average medical fee and drug expense per visit in Beijing community health institutions from 2009 to 2015 were listed in Table 2.

#### Table 2: Average expense per visit for outpatient service in Beijing’s community health institutions

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average medical expense per visit /RMB</td>
<td>110.8</td>
<td>112.9</td>
<td>138.1</td>
<td>153.9</td>
<td>155.3</td>
<td>174.4</td>
<td>195.9</td>
</tr>
<tr>
<td>Average medicine fee per visit /RMB</td>
<td>91.1</td>
<td>93.8</td>
<td>110.7</td>
<td>130.6</td>
<td>131.9</td>
<td>151.5</td>
<td>169.6</td>
</tr>
<tr>
<td>Average medicine fee accounting for average medical expenses per visit%</td>
<td>82.2</td>
<td>83.1</td>
<td>80.2</td>
<td>84.9</td>
<td>84.9</td>
<td>86.9</td>
<td>86.6</td>
</tr>
<tr>
<td>Variation of average medicine cost per visit compared with the previous year%</td>
<td>-</td>
<td>3.0</td>
<td>18.0</td>
<td>18.0</td>
<td>1.0</td>
<td>2.4</td>
<td>0.3</td>
</tr>
</tbody>
</table>

As shown in Table 2, the average medical expense per visit rose from 110.8 Yuan to 195.9 Yuan in community health service institutions from 2009–2015, with an annual growth rate of 9.96%. The proportion average medicine costs accounting for average medical expenses per visit in outpatient was relatively stable between 80% and 87%. However, with the implementation of the essential medicine system, the new list of essential medicines didn’t help reduce patients’ medical cost. The increase of medicine expense was caused by the supplement of essential medicines directory which increased the average drug price. Another factor was that the new drugs tender had seemingly reduced the price of medicine, but the inadequate supply of low-priced drugs forced physicians at the community centers to prescribe other more expensive alternatives.

### 3.3 ANALYSIS OF ESSENTIAL MEDICINES IN SHORT SUPPLY

The data showed there were 120 types of essential medicines with at least 167 drugs that were in short supply, including 27 types of emergency medicines. Among the out-of-stock medicines, 54 types of western medicines and 23 types of Chinese medicines were in the low-priced medicine directory released in 2014 by the National Development and Reform Commission. Together, these accounted for 64.2% of total medicines. Among these
low-priced medicines, 17 species were emergency medicines. It illustrated that the low price of essential medicines caused the inadequate supply of essential medicines.

Detail varieties of essential medicines in shortage were shown in Table 3.

Table 3: Distribution of essential medicine species in shortage in Beijing’s Community Health Institutions

<table>
<thead>
<tr>
<th>Medicine species</th>
<th>species in shortage</th>
<th>Percentage of the total essential medicine species in shortage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-infective drug</td>
<td>15</td>
<td>12.5%</td>
</tr>
<tr>
<td>Cardiovascular system drug</td>
<td>18</td>
<td>15.0%</td>
</tr>
<tr>
<td>Digestive system drug</td>
<td>15</td>
<td>12.5%</td>
</tr>
<tr>
<td>Respiratory system drugs</td>
<td>13</td>
<td>10.8%</td>
</tr>
<tr>
<td>Nervous system drugs</td>
<td>10</td>
<td>8.3%</td>
</tr>
<tr>
<td>Vitamin, mineral, compound amino acid and other nutrients supplements</td>
<td>6</td>
<td>5.0%</td>
</tr>
<tr>
<td>Ointment drugs</td>
<td>7</td>
<td>5.8%</td>
</tr>
<tr>
<td>Dermatological drugs</td>
<td>7</td>
<td>5.8%</td>
</tr>
<tr>
<td>Antipyretic analgesics anti-inflammatory, anti-gout drugs</td>
<td>7</td>
<td>5.8%</td>
</tr>
<tr>
<td>Hormones and endocrines medicines</td>
<td>4</td>
<td>3.3%</td>
</tr>
<tr>
<td>Anti-aging &amp; healthcare prescription</td>
<td>4</td>
<td>3.3%</td>
</tr>
<tr>
<td>Gynecological Medicines</td>
<td>2</td>
<td>1.7%</td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
<td>9.2%</td>
</tr>
</tbody>
</table>

As shown in Table 3, among the out-of-stock essential medicines, drugs for cardiovascular accounted for the highest portion of 15.0%, followed by anti-infective drugs, drugs for digestive and respiratory diseases respectively. These four types of drugs accounted for 50.8% of the total varieties in short supply. In addition, other types of essential medicines also had the same problem.

3.4 PROBLEMS IN THE USE OF ESSENTIAL MEDICINES

Interviewing the directors and other personnel at the centers we got to know that some well-known pharmaceutical enterprises failed in essential medicine centralized bidding and purchasing in 2017, and that was why some community health institutions could not use the domestically produced drugs with better efficacy as well as some imported brands. The available alternatives were essentially less well-known domestic brands with lower price. Patients were reluctant to use those medicines.

Another concern from patients was the quality of drugs with a low bid price. For example, Patients found the therapeutic effects of some anti-allergic drugs and antihypertensive drugs unacceptable and they had to increase the dose of them. And the matrix of some medicines for external use is not desirable. For instance, the matrix of compound zedoary turmeric oil suppositories is easily to melt hence brings patients bad use experience.

The low-priced essential medicines also tend to trigger medical staff’s concerns on drug quality, particularly for injections. Medical staffs are highly worried about their professional duties and potential liability for occurrence of adverse events caused by sub-standard injection of drug. At the same time, the increasing number of doctor-patient disputes made physicians reluctantly use infusion products, and they often advised patients to
be transferred to a larger hospital for such treatment. This deviated from the original intention of essential medicines system to bring convenience to patients and lower their medical expenses.

4. DISCUSSIONS

The implementation of the Essential Medicine System has lowered the cost of medical treatment in community medical institutions, alleviated the problem of expensive medical treatment to some extent, and improved the accessibility of community health services. However, there are still some negative aspects affecting the use of essential medicines in the community medical institutions. For instance, there is an inconsistency between essential medicines list and drugs prescribed in community institutions; Some of essential medicines are often out of stock; patients usually lack trust in brand and quality of essential medicines. All these factors caused that both the list and the supply of essential medicines can not meet the demands of patients, and the functions of essential medicines in providing medical security and reducing the drug fees were not well realized. These problems hindered the smooth implementation of essential medicine system, and weakened its role in improving health care quality as well as increasing drug expenses. Some essential medicine policies in practice have restricted the service capacity of community health institutions, and they also affected the function of community medical institutions.

The main reasons that the catalogue and the supply of essential medicine can not meet the needs of patients lie in:

First, the applicability of the Essential Medicine List is limited, and the list is not updated on a timely basis.

- Community medical institutions mainly deal with common diseases and frequently occurring diseases. Since the overall medical technology level of community medical center are not as advanced as large hospitals, and their disposal capacity is limited, medicines for treating less frequently occurring diseases or severe diseases in the Essential Medicine List are seldom used in community medical institutions.
- Some of medicines in the catalogue does not accord with the actual demand of city residents: drugs used in Class-2 or Class-3 hospitals are not synchronized with those for community use, thus the referral patients could not achieve follow-up drug treatment in the community; in addition, some medicines which have relatively more adverse reactions or are seldom used at present fail to update.
- Because some of the drugs commonly used in patients are not in the directory, community health institutions have to stock some non-essential medicines to attract patients and increase outpatient visits.
- Essential Medicine List serves for all the patients, but community medical services mainly for local residents with the elderly, chronic patients, women, children and the disabled as the major patient groups. Hence the applicability of Essential Medicine List is insufficient for community population.
So there is an inadequacy between the present list of essential medicines and actual medical demand in community health institutions.

Therefore, in order to improve the applicability of the Essential Medicines List we should take full consideration of the classification and the incidence feature of diseases, the characteristics of the patient group and so on. The drug range of common diseases and frequently occurring diseases should be expanded. At the same time, with the development of the economy and the progress of medicine, the Essential Medicine List should be updated regularly with medicines having better therapeutic efficacy and less adverse reactions.

Furthermore, procurement system is short of forward-looking design and it often ignored the manufacturer's game behavior on profits.

The out-of-stock situation of essential medicines was caused by the current centralized drug bidding procurement. The procurement in Beijing brought down the purchase price by about 26%. And low-priced medicines reduced the burden of consumers for a short time. However, each time after the bidding, a number of commonly-used drugs with low prices would disappear from clinical use. Since profits are the survival foundation of enterprises, many enterprises that won the bid are reluctant to produce. What is more, some high-quality enterprises even withdrew from bidding which had an impact on the supply and the quality of essential medicines. And this in turn affected the normal operations of community medical institutions.

The price of essential medicines should not be restricted for its proper releasing would enable it as a lever to adjust the market and it will find a balance point between guaranteeing the supplies of essential drugs and reducing economic burden on consumers. Moreover, there are inadequate measures to ensure the production and supply of less dosage but clinical necessary drugs. Subsidies and tax breaks or other policies by the government are in lack for emergency medicines.

Third, The List pays more attention on the basic health care while neglect higher levels of demands by patients. The reason why some essential medicines lacked brand recognition was that, in China, lots of patients evaluated the brand of medicines according to the prices. Most Chinese consumers think that the higher the price, the better the efficacy. Hence, patients often demand more expensive drugs in community health service institutions. And there is a big gap between the expectations of the patients and the present essential medicines system. This poor perception among consumers was supported by the study made by Chen Yao et al. The survey of patients’ attitudes towards community health service in Beijing showed that patients were not satisfied with the species and numbers of essential medicines.

Patients and medical personnel were also concerned about the quality of essential medicines. They often have low evaluation of drug quality and curative effect. There are more than 5000 drug manufacturers in China who have big differences in management level and equipment investment. Although these companies who produce
the same generic name according to the Pharmacopoeia, the final drug may have big gaps in quality. And because sophisticated quality assurance system for essential medicines has not been established yet, safety related to the quality of medicines could not be guaranteed. This safety concerns was further exacerbated by the fact that during the process of evaluation, price was often the decisive factor to get the bid, other important factors, such as the size and past reputation of the bidding enterprise, quality of the products were ignored. This emphasis on “low price” could lead to the low quality and efficacy of the drug bid.

The bidding system of essential medicines emphasizes on functions of cheap prices and basic medical security. However, many patients pay more attention on drugs of recognized brand or good efficacy and high safety. Hence the bidding behavior hasn’t focus on medical consumption psychology sufficiently. Therefore, the functions, characteristics, market, policy and other information of essential medicines required should be fully understood by the bidding system practitioners to determine the true clinical need, through analysis, careful and detailed implementation after bidding. Improving quality standards, limiting the approval of unnecessary drugs, and implementing a quality oriented bidding system and compensation system will force smaller and low-quality manufacturers to be out of the market. Through these efforts, the brand recognition and quality trust on essential medicines by patients would be improved enabling the community drug list to be more attractive.

5. RECOMMENDATIONS

In view of above, the methods of evidence-based practice should be applied in each field that implement the essential medicines system such as employing the best current research evidences, focusing on the clinical experience and evaluation, and giving consideration to both values and desires of patients about essential medicines to promote their utilization.

Therefore this article makes following recommendations:

- Update drugs in the list rarely used by community, and add those commonly used by patients in the list to improve its applicability. All these ought to be health-centered and demand-oriented for community residents.

- For the essential medicines of small dosage, low price and clinical necessity, the mechanism of fixed drug production enterprises should be established to guarantee the outputs according to clinical needs. For enterprises producing essential medicines in shortage, government intervention should be applied to strengthen their commitments to social responsibility, and to subsidize and award the enterprises who have completed the production tasks.

- The design of centralized bidding system of drugs need to add more flexibility such as establishing prior channels for manufacturers of high quality or brand drugs with historical precipitation. This will encourage these enterprises’ bidding in centralized procurement and help enhance public recognition of
community medicines. As for different regions have their own brands of high reputation, the local government need to establish a special channel or take other measures to include these brands in the winning directory.

- Build drug feedback and scoring information system in community health institutions, thus patients can give overall merits on indexes such as medicine’s quality, efficacy, convenience, price, and so on. By reference of these scores, essential medicines could be updated and eliminated to meet the needs of patients. It is beneficial to accumulate ‘high-quality’ and ‘excellent-price’ drugs gradually in community health institutions which the public are willing to use. Hence the essential medicines’ connotation and use rate could be improved.

- Establish the linkage mechanism between community centers and Class-3 Hospitals. By the mode that one Class-3 Hospital links several different districts of community centers, the community drug storehouse information could be shared with the large hospital by network, thus patients can go to the corresponding community center to access medicines and subsequent therapy after treatment in big hospital. Coordinated efforts and support from physicians and specialists in large hospitals would be conducive to increase patients’ acceptance of essential medicines.

Hence, good formulation of policies and joint efforts of all parties are necessities for the essential medicine system to improve medical quality and serve the public better, and the government should attach great importance on them.

**Acknowledgement**

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**6. REFERENCE**


