

Comparative Analysis of Actual Cost and Standard Cost of Single Disease

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How to cite this paper: Wang, C. Y., Chen, X., Pan, L. M., Huang, X. T., Xu, G. G., & Shang, X. L. (2021). Comparative Analysis of Actual Cost and Standard Cost of Single Disease. *Open Journal of Business and Management*, 9, 2735-2741.

<https://doi.org/10.4236/ojbm.2021.96151>

Received: September 13, 2021

Accepted: October 31, 2021

Published: November 3, 2021

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Abstract

This study analyzed the operation status of a Class III Grade I general hospital implementing single disease payment in 2020. Based on the clinical pathway, standard cost was established and the actual cost of the top five diseases that overspent was estimated. Compared with the standard cost, suggestions were put forward to set the standard cost of single disease reasonably and increase the cost control of single disease.

Keywords

Single Diseases, Actual Cost, Standard Cost

1. Introduction

In recent years, in order to control the continuous growth of medical costs, China has continuously deepened the reform of the medical and health care system and carried out the reform of medical insurance payment mode (Zhengrong Tang, Guangming Ye, & Biao Wang, 2012). In December 2018, Zhangjiakou City, Hebei Province, 50 diseases, including nodular goiter, were set as the first group of diseases to implement single disease payment. In 2019, a further 41 diseases were set as single disease payment, making the coverage of single disease payment more and more extensive (Jie Chen, Xingbao Chen, Jianwen Cao et al., 1993). In this regard, In order to understand the actual cost changes of diseases before and after the implementation of single disease payment, it is necessary to measure the cost of diseases, analyze the difference between the payment standard of single disease and the actual cost, and control the cost pertinently, so as to achieve the goal of effective utilization of medical resources. In this study,

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taking the top five single diseases of overspending in a Class III Grade I general hospital as an example, the actual cost and composition were calculated, unlike other studies, actual costs are compared with standard costs, further standardize hospital cost and medical expense control measures and suggestions, and provide new ideas for hospitals to carry out hospitalization expense management of single disease 1 data sources and methods.

The structure of the article is as follows: firstly, it introduces the data sources of this paper, explains the research content, expounds the research methods in detail, obtains the results of this paper, puts forward hospital medical cost control measures and suggestions according to the results, and finally lists the references of this paper.

1.1. Data Sources

The data in this study were derived from the discharged medical records in 2020 of a Class III Grade I general hospital, the financial statement of cost accounting of hospital departments, the statement of inpatient income of the hospital, the statement of human cost of the hospital, the statement of medical insurance of the hospital and the detailed statement of single disease.

1.2. Research Contents

The Actual Cost of the Top Five Overspent Diseases

Actual costs referred to the costs actually incurred by a single disease in 2020. Actual cost referred to the cost calculated according to activity-based costing based on the actual cost of a single disease. Disease quota was referred to the settlement fees set by medical insurance for single diseases, namely no matter the actual cost of the disease, medical insurance only presses corresponding quota to settle expenses, actual cost greater than quota was defined as overspending, actual cost less than quota was defined as saving.

In 2020, a Class III Grade I general hospital carried out 42 categories of single disease payment, with 800 cases. After removing 18 cases with complications, the total cases number was 782, and the total cost was 22297,500 ¥, with an over-spending of 1,524,100 ¥ and an over-spending rate of 6.84%. Among them, the top five diseases of over-spending diseases were: 83 cases of uterine leiomyoma, 39 cases of rectal malignant tumor, 12 cases of femoral neck fracture, 29 cases of unilateral inguinal hernia, 12 cases of endometrioma (adenomyosis), a total of 175 cases were included. The included sample cost accounted for 22.34% of the total cost, with an over-spending of 1,017,800 ¥ and an over-spending rate of 20.44%.

According to the latest version of clinical pathway released by the National Health Commission in 2019, combined with the actual situation of hospital, specialist doctors, nurses, medical technology and administrative departments jointly refined and improved the clinical pathway, and finally formulated the clinical pathway suitable for local hospital after approving by the medical and adminis-

trative departments. The financial department calculated the standard fee by converting it into specific charging items according to the clinical pathway developed by the hospital. Calculated standard cost according to standard cost using activity-based costing.

1.3. Research Method

Using activity-based cost method, according to the attribution of hospital expenses, the disease cost was divided into drug cost, material cost, surgery and anesthesia cost, bed examination cost, treatment and nursing cost, examination and laboratory cost, and other costs. The specific calculation formula was as follows:

Drug cost = drug purchase price of diseases + pharmaceutical service cost,
 pharmaceutical service cost = drug cost \times direct cost of pharmacy department/
 drug revenue;

Material cost = revenue of materials of diseases/(1 + materials markup rate) +
 service fee of consumables management, service fee of consumables manage-
 ment = revenue of materials \times direct cost of Medical Engineering Department/
 revenue of materials;

Surgery and anesthesia cost = surgery and anesthesia income of diseases/total
 revenue of surgery and anesthesia \times cost of surgery and anesthesia room + intra-
 operative labor cost of surgeons;

Cost of bed examination = labor cost of doctors in inpatient department/total
 bed days in inpatient department \times number of inpatient bed days of diseases;

Treatment and nursing cost = treatment and nursing income of diseases \times
 annual nursing labor cost of ward/(annual nursing income of ward + injection
 income + other treatment expenses);

Examination and laboratory cost = income from disease examination and la-
 boratory test \times cost rate of each medical technology department;

Other costs = other income of diseases \times cost rate of other items.

Finally, the actual costs of five types of diseases were classified, summarized
 and measured, and the actual cost, standard cost and disease quota of five types
 of diseases were compared and analyzed.

2. Results

2.1. Cost Analysis of Five Overspending Diseases

Among the five diseases, the cost of femoral neck fracture was 7.91% higher than
 that of income, and the income and cost of other diseases were basically the
 same. In the cost composition, the cost of drug and consumables for rectal ma-
 lignant tumor, femoral neck fracture and unilateral inguinal hernia accounted
 for a high proportion of more than 50%. However, for endometrioma (adeno-
 myosis) and uterine leiomyoma, the proportion of the cost of pharmaceutical ma-
 terials and the proportion of the cost of surgery and anesthesia were both higher,
 with the total of about 70% (**Table 1**).

Table 1. Income cost of five diseases and composition of various expenses.

Disease	Average cost of five types of diseases			Cost of drugs and consumables ratio/%	Cost of anesthesia ratio/%	Cost of treatment and nursing ratio/%	Cost of examination ratio/%	Cost of laboratory test ratio/%	Cost of bed examination ratio/%	Cost of other aspects ratio/%
	Income (¥)	Cost (¥)	Cost ratio/%							
rectal malignant tumor	56,062.04	55,322.07	98.68	57.36	16.07	9.55	6.34	3.10	6.06	1.51
femoral neck fracture	47,803.46	51,585.36	107.91	68.77	6.85	10.70	2.30	3.12	6.43	1.83
endometrioma (adenomyosis)	19,999.14	19,855.93	99.28	35.44	33.28	11.99	3.44	7.10	7.26	1.48
uterine leiomyoma	18,551.66	18,498.61	99.71	37.66	30.38	11.82	3.57	7.94	6.95	1.67
unilateral inguinal hernia	15,181.56	15,440.16	101.70	52.00	21.77	6.98	3.16	7.17	7.80	1.12

Because the settlement of single disease is according to quota, the actual loss amount of the hospital should contain overspending amount. The actual loss of the hospital can be obtained by calculating the actual fees, actual cost and overspending fees of single disease.

Calculation method: single disease overspending = income – single disease quota × cases, actual loss = income – cost – overspending. The overspending of the hospital for five diseases was 1,017,800 ¥, and the actual loss was 1,0355,700 ¥ (**Table 2**).

2.2. Comparison of Actual Cost and Standard Cost of Five Overspending Diseases

The cost situation can be clarified by comparing actual cost with standard cost. At the same time, through specific analysis of the differences between the two costs, the standard cost can be continuously optimized, so as to control the actual medical expenses. The actual cost of femoral neck fracture, uterine leiomyoma, unilateral inguinal hernia, and endometrioma (adenomyosis) were significantly different from the standard cost, and the standard cost of the first three was very high (**Table 3**).

3. Discussion and Suggestion

3.1. Set up Standard Cost of Single Disease Reasonably

3.1.1. The Proportion of Drug and Consumables Cost Is Too High, and the Standard Cost Is Higher Than the Actual Cost

The study showed that the cost of drug and consumables for femoral neck frac

Table 2. Actual loss for five diseases.

Disease	Quota (¥)	Case number (n)	Income (¥)	Cost (¥)	Overspending (¥)	Actual loss (¥)
uterine leiomyoma	14,000	83	1,539,789	1,535,385	377,789	373,385
rectal malignant tumor	481,000	39	2,186,420	2,157,561	310,520	281,661
femoral neck fracture	35,000	12	573,642	619,024	153,642	199,024
unilateral inguinal hernia	11,600	29	440,266	447,765	103,866	111,365
endometrioma (adenomyosis)	14,000	12	239,990	238,271	71,990	70,271
Summation	--	175	4,980,106	4,998,005	1,017,806	1,035,705

Table 3. Comparison of actual cost and standard cost for single cases of five diseases (¥).

Disease	Standard fee	Actual cost	Standard cost	Cost differentials
rectal malignant tumor	60,324.3	55,322.07	55,510.90	-188.83
femoral neck fracture	57,274.57	51,585.36	61,997.24	-10,411.88
endometrioma (adenomyosis)	19,490.58	19,855.93	17,546.82	2309.11
uterine leiomyoma	18,982.39	18,498.61	19,316.32	-817.71
unilateral inguinal hernia	22,832.52	15,440.16	22,920.41	-7480.25

ture has already exceeded the medical insurance quota, and the cost of drug and consumables for rectal cancer and unilateral inguinal hernia accounted for 65.97% and 69.21% of the medical insurance quota, respectively. The standard cost of drug and consumables of these diseases is very high, which is higher than the actual fees of consumables (Limin Wen & Jun Wang, 2002). It can be seen that the high-cost proportion of drug and consumables is the main problem leading to overspending of single diseases, and it is also the focus of cost control of single disease (Quan Wang, 2013). Therefore, it is necessary to re-determine the standard cost of drug and consumables and control the use of nutritional, auxiliary and valuable drugs, imported consumables and high-value consumables. According to the actual conditions of diseases, differentiated drug and consumables standards were set and dynamically adjusted continuously to reasonably could reduce the cost of drug consumables.

3.1.2. The Actual Cost of Surgery and Anesthesia, Bed, Nursing, Diagnosis and Treatment, and Accompanying Bed Is Higher Than the Standard Cost

The main reason why the actual cost of surgery and anesthesia was higher than the standard cost was that other secondary operations were carried out during the surgery, which led to the increase of the cost of surgery and anesthesia, especially in the surgery of endometrioma (adenomyosis) and uterine leiomyoma (Wenbo Guo, Lan Zhang, Jingqin Kuang et al., 2017). To this kind of disease, additional reimbursement may be required from medical insurance, or a fixed fee may be increased according to the surgery procedure.

The cost of beds, nursing, diagnosis and treatment, and accompanying beds

were all related to the length of hospitalization of patients. The actual cost was higher than the standard cost, indicating that the actual length of hospitalization of patients exceeded the standard set days, and the length of hospitalization should be further shortened. At present, the hospital has adopted the pre-hospitalization mode, which can reduce the waiting time of patients for examination by 2 - 3 days. At the same time, hospitals were required to further carry out selective surgery and shorten the appointment time of large-scale examination, so as to improve the utilization efficiency of medical resources such as beds and nursing (Chunjing Ni, Yi Huang, & Hongming Chen, 2016).

In addition, the standard cost of a single disease was determined by the hospital according to the clinical path and its own situation, which was subjective to a certain extent, resulting in a certain deviation between the standard cost and the actual cost of a single disease. Therefore, in the future, when hospitals carry out standard cost control for single disease, on the premise of ensuring the quality of medical treatment, the differences that do not conform to the standard treatment plan of single disease should be timely fed back through information means, and dynamic adjustment should be made after expert discussion, so as to strictly control the medical cost of all links from admission to discharge, so as to reduce the actual cost of the disease to a reasonable level (Guanghua Wu, Hong Zheng, Guoxiang Liu et al., 2007). Only when the actual cost of providing medical insurance is lower than the quota for each disease, can hospitals achieve profitability and thus ensure sustainable development (Jing Pei, Xiaorong Zhou, Jiawei Li et al., 2017).

3.2. Strengthen Cost Control of Single Disease

For single disease management, on the one hand, it is necessary to optimize the cost structure, strictly in accordance with the standard cost to control over-spending; On the other hand, it is urgent to carry out cost control and control with reasonable means to control cost growth. For example, perfect the hospital information system, realize the effective integration and data sharing of various management systems, carry out the hospital full cost accounting, improve the efficiency and quality of cost accounting (Yan Chen & Suan Wang, 2020). We will strengthen material cost control, with the goal of revitalizing resources and reducing operating costs, encourage all staff to participate in energy conservation and consumption reduction, strengthen awareness of conservation, and reduce waste of energy and materials. On the basis of ensuring hospital services and benefits, we should plan human resources reasonably, arrange posts scientifically and rationally, and control human cost.

4. Conclusion

To sum up, prepayment according to single disease is an effective way to promote hospital scientific management, rational examination and rational drug use. Implementing cost control of single disease, strengthening health economic

management, accurate and reasonable cost accounting, and strengthening the control of drug use and inspection are one of the methods to reduce hospitalization expenses (Xixia Wu, Yu Zhuang, Shu Dong et al., 2019). Reform the management mode and strengthen the clinical pathway management of single disease. Scientifically and reasonably determining the clinical path of single disease and determining the smooth implementation of single disease payment are a scientific method to reduce the medical expenses of inpatients. Payment by disease has indeed played a certain role in controlling medical expenses, but there are still some areas to be improved. For example, in terms of disease selection, payment standard formulation and exit mechanism, the future trend of payment by disease will transit to group payment by disease. During this period, medical institutions should increase the research on clinical pathway, focus on the improvement of medical quality and medical technology, and further improve the diagnosis and treatment level of complex and difficult cases.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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