Short Communication

Cost of establishing a general dentistry department in a small or medium-sized hospital

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Abstract: To contribute to future dental healthcare policies, this study compiled data on hospital expenses and follow-ups conducted after a hospital dentistry department was established. In addition, the management status and reports on the utility and challenges of establishing a dentistry department were analyzed. The dentistry department was established through fund raising and inaugurated in May 2009. The depreciation period was set at 7 years, and income and expenditure during the 7 years 8 months after opening were compiled. In total, 17.22 million yen was needed for the dentistry department. The average income from dental care was 21.59 million yen per year, and expenditure amounted to 21.54 million yen per year. The findings indicated that a general dentist able to systemically manage patients was essential in a chronic-care hospital. Moreover, the present findings indicate that if general dentistry consultations were performed without excessive investments, after adjusting for personnel expenses, such an initiative would neither yield considerable income nor produce a substantial deficit. Finally, it is imperative to develop staff who are familiar with the costs and management of hospital dentistry and to increase medical fees for consultations with elderly patients.

Keywords; dentistry department, dental healthcare, hospital management, follow-up study, oral healthcare management

Introduction

Japan is now a super-aged society, and the importance of oral healthcare management has become obvious [1,2], which has led to considerable expectations for dentists in hospital dentistry. However, although expenditures are not high, low hospital income remains a challenge in establishing and maintaining a hospital dentistry department. Business deficits affect hospital survival, and in some cases there is no option but to provide healthcare services in a community.

Therefore, in 2009, a general dentistry department was established in a long-term care hospital with 199 beds. The hospital also had departments of internal medicine, orthopedics, and rehabilitation. No previous study has provided a consolidated follow-up report on hospital income and expenditures after establishment of a dentistry department. Thus, the present authors hope to contribute to future dental healthcare policies by compiling data on hospital expenditure and conducting follow-ups for the 7 years 8 months after establishment of a hospital dentistry department. The management status of the department is analyzed, and the utility and challenges of establishing such a department are discussed.

Materials and Methods

First, funds totaling 17.22 million yen were raised to set up the dentistry department, which was inaugurated in May 2009. The depreciation period was set at 7 years, and income and expenditures during the 7 years 8

months after opening were compiled. Extraction of income and expenditure data was based on health insurance claims and past ledgers. Calculation of expenses included costs related to hospital clerical work, cleaning, disinfection, social security, welfare pension, retirement funds, welfare expenses, utility, the premises (equivalent to property tax), and expendable supplies. In addition, five dentists from various universities were hired as full-time employees to provide medical care, and data on medical income per dentist were also compiled. At the time, the dentists had an average of 7 years of experience after graduation: one had a background in oral surgery, and four had practiced prosthodontics. The management staff consisted of one dentist. Initially, one full-time dental hygienist was employed, as were one or more part-time dental hygienists. However, system revisions in June 2012 led to the employment of two full-time dental hygienists. The newly opened dental office was approximately 30 m² and contained two dental chairs. Receipt computers used were by Profit i (Yoshida & Co., Ltd., Tokyo, Japan), and two clinical units were set up.

The status of medical care for a week is summarized. The data include demographic information, including patient mean age, sex, and activities of daily living (ADL) and functional tasks (e.g., walking independently, gait, and use of a walker, wheelchair, or stretcher). Next, data on whether a person was a first-time or repeat patient, if dental care received was part of an outpatient or home patient visit, and primary disease (e.g., tumor, heart disease, respiratory disease, cerebrovascular disease, renal failure, hypertension, and diabetes) were compiled. The percentage of patients with impaired oral health because of an underlying disease; the type and duration of medical treatment provided (e.g., conservative treatment, prosthetic treatment, oral surgery, and oral hygiene management); management of oral hygiene (e.g., scaling, scaling and root planing, professional mechanical tooth cleaning, brushing, and sponge brush); and the benefits of dental interventions were all determined.

Results

Table 1A details the funding structure for establishing the dentistry department. Seven years 8 months after inaugurating the department, the average income from dental care was 21.59 million yen per year (1.8 million yen per month, SD: 430,000 yen). Further analysis of income showed that 98.6% of patients received an insurance-reimbursed medical examination. The difference between the maximum and minimum mean monthly medical income per physician was 990,000 yen. Expenditure amounted to 21.54 million yen per year (1.8 million yen per month, SD: 130,000 yen; see Table 1B for details). However, because fractions were rounded, the values do not add up to the total in a simple calculation. Income and expenditures yielded a surplus of 320,000 yen during the study period.

Mean patient age was 73.4 ± 15.7 years (range, 18-99 years), and half the sample was male. Furthermore, 19% visited the department for the first time, 81% were visiting for follow-up consultations, and 72% of patient visits were part of outpatient treatment. In 51% of patients, underlying disease led to a decline in oral self-care. After dental intervention, the proportion of patients who improved was 35% in food form, 31% in aspiration pneumonia, and 3% in heat generation; 50% were unknown (with duplicate calculation). Table 2 presents data on medical care, namely, ADL, underlying disease, medical care received, duration of each treatment, and details of oral hygiene management.

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Table 1 Expenditure

		Ratio(%)
A	Renovation	21.5
	Dental unit (2 units), diagnostic devices, X-ray, receipt computer set, etc.	65.0
	Equipment (basic set, dental materials etc.)	7.7
	Dental implant equipment	5.8
B	Personnel expenses	58.4
	Materials, dental technician fee	19.3
	Depreciation expenses	11.9
	Fixed cost	9.8
	Receipt computer administration fee	0.6

A, breakdown of funds for the establishment of the department; B, expenditures over 7 years 8 months

Discussion

The present findings show that, with some improvements, the cost of establishing a dentistry department can be reduced and that the total cost is approximately 15-20 million yen. For example, sterilizer, computed tomography (CT) rooms, waiting rooms, toilets, and dentist/staff rooms could reduce costs considerably. In addition, a dental clinic with two approximately 30-m² units could be established. Moreover, existing equipment, such as medical CT, magnetic resonance imaging, and blood sampling devices, could be used, and their utilization rates could be considerably increased.

In terms of income from medical practices, labor costs account for most of the spending. If the annual income of a dentist is approximately 7.2 million yen (600,000 yen per month), the income should be at least 24 million yen (2 million yen per month). Accordingly, if income goes up, compensation for dental care workers could improve. In general, about 30% of total medical income is spent on compensation for private practice dentists (20% for private practice physicians; Ministry of Health, Labour and Welfare, Japan, https://www.mhlw.go.jp/bunya/iryuhoken/database/zenpan/jittaityousa/dl/21_houkoku_iryokukan.pdf, accessed December 11, 2018). However, hospital dentistry mainly focuses on dental care for persons with underlying diseases, and the procedures are thus more difficult and more time consuming than those for otherwise healthy patients (Table 2) [3]. Therefore, the numbers of patients examined and treated per day are smaller, and demand for emergency evaluation and treatment is higher than in private dental clinics, and workloads are greater than those of private practice physicians. The existing remuneration system for dental care and treatment provides low unit prices for dental care and treatment for patients with underlying diseases, and the efforts of dental healthcare professionals will not alone adequately address this clinical situation. Soon, it may be possible to calculate annual income trends by evaluating follow-ups of patients with underlying diseases, such as perioperative management of oral function.

In this study, five dentists were assigned to manage the clinic, but their incomes differed considerably. To maintain stable management, salaries need to be determined by anticipating responsibilities. In addition, stable employment of dental hygienists is essential. The two dental hygienists at the hospital are veterans with 37 and 24 years of work experience and are adequately supportive of the dentists.

Medical hospital managers are unfamiliar with the calculations, equipment, and materials used in dentistry and have difficulty assessing the low income levels and appropriateness of spending. Hospital dentistry departments usually focus on general dentistry, not on dental or oral surgery; thus, it might not be possible to increase income in a hospital dental clinic that treats patients with underlying diseases. Revenue can be increased by actively combining dental with medical care provided at the patient's expense, or by increasing the number of surgical procedures; however, if interventions account for patient ADL and quality of life (QOL) issues, the financial estimates mentioned above might be averages. In other words, when managing a hospital dentistry department, particularly in light of the duration of patient examinations, calculations might need to encompass data from patients with chronic diseases visiting the hospital dentistry department. Previous studies reported that when oral care and management of hospitalized patients was improved by the addition of such informa-

Table 2 Status of medical care

		Ratio(%)
A	Independent gait	63.8
	Walker	13.8
	Wheelchair	19
	Stretcher	3.4
B	Tumor	1.7
	Heart disease	48.2
	Respiratory disease	6.9
	Cerebrovascular disease	44.8
	Renal failure	15.5
	Hypertension	44.8
	Diabetes	24.1
	Others	34.5
C	Oral hygiene	91.7
	Prosthetic	88.9
	Conservation	72.2
	Oral surgery	8.3
D	Scaling	62.1
	Brushing	43.1
	PMTC	10.3
	Sponge brush	1.7
	SRP	62.1

A, activities of daily living (ADL); B, underlying disease (with duplicate calculation); C, type and duration of medical care received (with duplicate calculation); D, oral hygiene management (with duplicate calculation)

tion [4], there were fewer cases of fever and aspiration pneumonia, and the duration of hospital stay decreased, which, in turn, reduced medical expenses.

When the present department was established, preparations were made so that the clinic could perform oral surgery. The treatments included prosthetic and oral care, and preparation of dental implant equipment was thus not needed. In this study, expenses were calculated as actual minimum necessary expenses, and overall hospital management included other costs, such as social expenses and maintenance fees. Therefore, a higher number of expenses will likely be added to the costs.

A general dentist capable of systemic patient management is crucial in a chronic hospital. If general dentistry consultations are performed without excessive investment, after adjusting for personnel expenses, such an initiative will neither earn considerable revenue nor lead to a substantial deficit. However, establishment of a dental clinic contributes both to management of hospitalized patients (Table 2) and to increasing staff awareness of oral cavities, thus greatly aiding in health maintenance. Therefore, such an initiative could be very beneficial for a hospital. Finally, development of staff who are familiar with the cost and management of a hospital dentistry department, as well as improvements in medical fees related to medical consultations for elderly adults, will be needed in the future.

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Conflict of interest

None.

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