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Prescription Order Volume at a Hospital Pharmacy during a 12-year Period

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I investigated the change in volume of prescription orders at Tatebayashi Kosei Hospital pharmacy between 1978 and 1989, during this period, the volume showed considerable increase. The number of prescription order sheets doubled, but the number of prescriptions and prescribed days tripled, indicating an increase in multiple drug prescription and drug medication period. The number of prescriptions per pharmacist doubled, whereas the number of pharmacists showed smaller increase. Of types of medications prescribed during the entire period, tablets, capsules and powder preparations constituted approximately 70% to 80%, liquids and mixtures about 10% to 20%, and those for external use about 4% to 6%.

Keywords—prescription order volume; prescriptions; dispensing; prescription analysis; prescription survey

Introduction

The recent increase in the number of prescription orders in hospital pharmacies is an issue of concern. While many hospital pharmacists have begun to expand their roles by engaging in the preparation of hyperalimentation products and dialysis fluids, intravenous additive programs, and drug consultation with patients, the dispensing of drugs remains an essential part of their services. A recent report of the Japanese Ministry of Health and Welfare indicates that the recent increase in patient population is due to changes in the social structure, the recent appearance of new fields of medical research, more sophisticated technology, and new drugs, and increased longevity, which has consequently increased the number of elderly patients¹⁾. Furthermore, it has also been suggested that the greater incidence of multiple disorders in the elderly has also contributed to multiple drug prescriptions, as the elderly consume a large proportion of all drugs prescribed²⁾.

The purpose of the present survey was to examine the factors involved in the increase in volume of prescription orders observed at Tatebayashi Kosei Hospital pharmacy department during a recent 12-year period. In addition, at present, the hospital employs 42 physicians and 190 nurses, and has 358 beds. The average daily out-patient and in-patient caseload is approximately 800 and 300, respectively.

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This hospital size is ranked medium among 10054 hospitals authorized in Japan (1989—annual report of the public enterprise association).

Materials and Methods

I examined annual number of prescription order sheets, prescriptions, prescribed days, and dose per day recorded in pharmacy prescription order files at this hospital pharmacy department during the years 1978 to 1989. Data were examined per pharmacist and per order sheet. In addition, the type of medication prescribed was classified according to whether it was oral tablets, capsules, or powder preparations (Group I), oral liquids or mixtures (Group II), or preparations for external use (Group III). All data are expressed as mean values per hospital day.

Results

Figure 1 shows the mean daily number of prescription order sheets, prescriptions, and days prescribed for each year. The number of order sheets showed constant gradual increase, whereas the number of prescriptions and days prescribed increased more markedly. Moreover, since 1984, the number of days prescribed has shown acceleration of rate of increase. During the survey period, the number of order sheets increased 89.4%, number of prescriptions by 222.3%, and number of days prescribed by 200%.

As Figure 2 shows, the numbers of prescriptions and days prescribed have continued to increase each year. Since 1984, days prescribed has shown greater acceleration of increase than prescriptions; the former exceeded the latter by approximately 23% in 1984 and by 35% in 1989.

As shown in Figure 3, the number of prescriptions per pharmacists increased considerably over the 12-year period, while the number of pharmacists increased more moderately. The former exceeded the latter by approximately 67% in 1988 and by 60% in 1989.

Figure 4 shows numbers of each of the three medication types prescribed each year. The increase in the number of Group I medications prescribed during the 12-year period was considerable, while that of Group II between 1978 and 1985 was only slight. Number of Group III medications prescribed increased by 87.5% during the 12-year period. Of medications prescribed during the entire 12-year period, Group I constituted 75.5% to 78%, Group II 15.5% to 19.6%, and Group III, 4.5% to 6.5%.

Discussion

The present survey clearly revealed an increase in prescription order volume at this pharmacy department during the 12-year period. The number of prescription order sheets doubled, while that of prescriptions and of days prescribed tripled. These findings are consistent with those in recent reports of increase in multiple drug prescription and prescribed days or drug medication period³⁻⁶⁾. From 1961 until 1981, number of prescribed days for all prescription drugs was fixed at within 14 days by the laws regulating Japan's national health care insurance system. In 1981, and again in 1984, the prescription period for some drugs used for selected chronic disorders was extended to 30 days. In fact, the number of prescribed days has increased gradually each year since the first change of the law went into effect in 1981, as has been reported by several investigators³⁻⁵⁾.

Fig. 1. Annual number of prescription order sheets, prescriptions, and days prescribed from 1978 to 1989 (mean, per hospital day)

Fig. 2. Annual number of prescriptions and days prescribed per prescription order sheet from 1978 to 1989 (mean, per hospital day)

Fig. 3. Annual number of prescriptions per pharmacist and number of pharmacists from 1978 to 1989 (mean, per hospital day)

Fig. 4. Annual number of medications of each of three types prescribed from 1978 to 1989 (mean, per hospital day)

Masuike et al.⁶⁾ reported that the number of prescriptions per order sheet in hospitals with 300 and 448 beds increased from 1.5 to 2.2 and from 1.7 to 2.2, respectively, between 1970 and 1983. A 1986 nationwide survey of 46 public hospitals of similar size disclosed that the number of prescriptions per order sheet was 2.3⁷⁾. These findings suggest that increase in multiple drug prescription shows some variance, and Michael et al.⁸⁾ have also suggested that results of such surveys are influenced by hospital size, region, and survey year.

Since multiple disorders in elderly patients are likely to result in multiple drug prescription, the potential risks and harmful consequences of polypharmacy should always be considered²⁾. Recently, Kimura^{9,10)} reported that data regarding prescriptions for the elderly are still scarce.

The increase in the number of pharmacists found in the present study was not as great as the increase in the number of prescriptions, and similar findings were found in surveys for 1952–1982⁶⁾ and for 1982¹¹⁾. Since 1948, one pharmacist per every 80 prescriptions has been designated to be minimum staffing under the Japanese pharmacy law. There is no doubt that, as the number of prescriptions increases, the pharmacist's workload increases, and that accurate dispensing may be jeopardized if workload is excessive. The Japanese Society of Hospital Pharmacists has recently proposed that such fixed number estimation be replaced¹²⁾.

The present analysis of the types of medications prescribed revealed that most were oral tablets, capsules, or powders, some were liquids or mixtures, and only a few were for external use, and that the number of medications in the former two groups continued to increase during the survey period. In surveys of two different university hospital pharmacy departments (for 1978–80 and 1986, respectively), Ohizumi et al.¹³⁾ and Fujishiro et al.¹⁴⁾ reported that oral tablets, capsules, and powder preparations formed 82% and 84%, preparations for external use 13% and 14%, and liquids 5% and about 2%, respectively, of all medications prescribed. In a nationwide survey in 1986 of 9983 prescription orders filled by licensed drugstores, Nakamura et al.¹⁵⁾ found that oral tablets and capsules constituted 61.2%, powders 32.8%, and solutions 5.8% of all medications prescribed, and suggested that the number of tablet and capsule prescriptions increased during their study period.

Finally, in addition to the effect of the factors discussed above on prescription order volume, it should be noted that data on prescription order volume is likely to be influenced by many factors, including medical staff organization, hospital ownership status, economic climate, and survey methods.

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