Demand for weekend outpatient chemotherapy among patients with cancer in Japan

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Abstract

Background Advanced cancer therapeutics have improved patient survival, leading to an increase in the number of patients who require long-term outpatient chemotherapy. However, the available schedule options for chemotherapy are generally limited to traditional business hours.

Method In 2017, we surveyed 721 patients with cancer in Okayama, Japan, regarding their preferences for evening and weekend (Friday evening, Saturday, and Sunday) chemotherapy appointments.

Results A preference for evening and weekend appointment options was indicated by 37% of the respondents. Patients who requested weekend chemotherapy were younger, female, with no spouse or partner, living alone, employed, and currently receiving treatment. Among these factors, age and employment status were significantly associated with a preference for weekend chemotherapy, according to multivariate analysis.

Conclusion Our findings reveal a demand for evening and weekend outpatient chemotherapy, especially among young, employed patients.

Keywords Weekend chemotherapy · Outpatient · Social burden · Cancer patient

Introduction

Advanced cancer therapeutics have improved patient survival but have also led to an increase in the number of patients who require long-term outpatient chemotherapy [1–3]. Treatment of patients with cancer in an outpatient setting is important for reducing the social burden of therapy and for maintaining quality of life (QoL) among these patients, as it allows them to integrate treatment into daily life [4–7]. However, outpatient chemotherapy often involves an extended duration of treatment, frequent hospital visits, long examinations before treatment, and (in some instances) prolonged infusion of anticancer drugs [8]. Consequently, outpatient treatment may affect patients’ daily life [9, 10]. The burdens associated with numerous extended-duration chemotherapy appointments may be partially mitigated by accommodating the patients’ lifestyles, such as by offering evening or weekend outpatient chemotherapy. Most Japanese hospitals, especially cancer treatment hospitals, offer outpatient chemotherapy only during weekday business hours. While a few hospitals currently offer weekend outpatient chemotherapy, the patient demand for this service has not been formally evaluated. The aims of this study were (i) to assess whether there is a substantial demand for evening or weekend outpatient chemotherapy and (ii) to identify the sociodemographic and clinical factors of patients with a preference for evening or weekend outpatient chemotherapy.

Methods

Okayama Prefecture is a prefecture in Japan with a total population of approximately 1.9 million (approximately 1.2 million reside in two major cities, Okayama and Kurashiki). In a 2017 survey, 29.6% of the population was ≥ 65 years of age.
Approximately 5600 people in the prefecture die from cancer each year. Our study was based on the results of a questionnaire sent to all designated cancer hospitals in Okayama Prefecture.

From August to September 2017, we conducted an anonymous, cross-sectional survey of the patients at 13 designated cancer hospitals (listed in Acknowledgements) in Okayama Prefecture, by means of a questionnaire distributed to outpatients ≥ 20 years of age who were currently undergoing treatment for cancer. Survey items included basic demographic information (i.e., age and sex), social background (i.e., marital status, cohabitation status, residence, employment, and annual personal income), and cancer characteristics (i.e., cancer type, current treatment status, and duration of treatment). Patients were also queried regarding their desire for evening and weekend (i.e., Friday evening, Saturday, or Sunday) outpatient chemotherapy. Personal income was stratified into annual income of < $20,000, $20,000–$39,999, and ≥ $40,000, according to the currency conversion rate at the end of the survey (US $1 = ¥112.47, 30 September 2017). The age at diagnosis and duration of treatment for patients with multiple cancers were defined as the age at diagnosis of the first cancer and the total duration of all cancer treatments, respectively. After the questionnaire had been completed by outpatients at each hospital, it was returned by mail to our hospital.

The interest of the survey respondents in weekend outpatient chemotherapy was assessed, and the relationships between patients’ sociodemographic and clinical factors were then analyzed. Statistical analysis was conducted using SPSS Statistics, version 25.0 (IBM Corp., Armonk, NY, USA). The chi-square test was used for comparison, with differences considered significant at \( p < 0.05 \). Multivariate logistic regression analysis was performed using factors identified as significant in univariate analysis. The study protocol was approved by the Institutional Review Board of each participating hospital.

### Results

The questionnaire was distributed to a total of 1500 patients; of these, 721 responded (48.1%). A preference for weekend chemotherapy was indicated by 36.5% of the respondents; the most common request was a Saturday appointment option (Table 1).

Sociodemographic and clinical characteristics of the patients and the relationship of each factor with the desire for weekend chemotherapy are summarized in Tables 2, 3, and 4. A large number of questionnaire respondents were women, although men are generally more likely to develop cancer. The high number of women among the respondents was presumably because of the high response rates among patients with breast cancer (25%) and gynecological cancers (7%). Because these cancer types often affect younger people than other cancers [11, 12], the women who participated in the study were 8 years younger than the men who participated in the study. The average ages of cancer onset were 55 years for women and 63 years for men (Table 3). This clinical characteristic may have led to bias in the sociodemographic characteristics of patients with cancer in this study [12].

The relationships between a preference for weekend chemotherapy and sociodemographic and clinical factors were analyzed; results are shown in Tables 2 and 4. Patients who were younger, female, with no spouse/partner, living alone, and employed most commonly indicated a preference for evening and weekend chemotherapy. Multivariate analysis showed that age and employment status were significantly associated with a preference for weekend chemotherapy (Table 5).

### Discussion

To the best of our knowledge, this is the first study to evaluate interest in evening and weekend outpatient chemotherapy. Outpatient chemotherapy services are important for maintenance of patient QoL; however, outpatient treatment requires frequent visits to the hospital, which may be socially burdensome for some patients with cancer. To reduce the social burden on patients with cancer, we explored whether there was an unmet demand for evening or weekend chemotherapy.

In our study, nearly 37% of patients expressed interest in weekend outpatient chemotherapy. Notably, in a study of the employment and economic burdens posed by cancer treatment, two common social costs of cancer, 21% of Japanese patients took early retirement due to cancer [13], while 44% reported a financial burden imposed by cancer treatment [14]. Our data showed that a similar number of patients reported a burden associated with the availability of outpatient anticancer chemotherapy on weekdays alone.

Possible burdens of outpatient chemotherapy for patients with cancer include (i) a direct burden to travel to and from the hospital, such as transportation cost and physical effort, (ii) social burdens required for hospital visits, such as taking time off of work, and so on. Several factors, either alone or in combination, may influence the desire for weekend outpatient chemotherapy. For example, younger patients might have more work and a busier social life [15, 16], which would

### Table 1 Desire for Friday evening and weekend chemotherapy

|         | N   | %   |
|---------|-----|-----|
| No request | 458 | (63.5) |
| Request | 263 | (36.5) |
| Friday night* | 117 |
| Saturday* | 184 |
| Sunday* | 145 |

*multiple answers
increase their interest in weekend treatment. Furthermore, older patients might experience difficulty in traveling to the hospital [17] and would therefore also prefer a weekend treatment option. In our study, factors presumably related to the travel burden, such as proximity to the hospital or reliance on a spouse or cohabitant for assistance in traveling to the hospital, were identified in univariate analysis. However, multivariate analysis found that age and employment status, but not direct burden to travel, were significantly associated with a desire for weekend chemotherapy. These results suggested that it was

Table 2  Patient sociodemographic characteristics and results of univariate analysis

| Characteristics                      | Total | Request | OR | p value |
|--------------------------------------|-------|---------|----|---------|
|                                      | N (%) | No      | Yes |         |
| Age group at time of study           |       |         |     |         |
| Less than 40 years                   | 19 (2.6) | 8 | 11 |         |
| 40–59 years                          | 254 (35.2) | 109 | 145 |         |
| 60–79 years                          | 400 (55.5) | 300 | 100 |         |
| More than 80 years                   | 43 (6) | 37 | 6 | 82.36 < 0.001 |
| Missing                              | 5 (0.7) |       |     |         |
| Gender                               |       |         |     |         |
| Male                                 | 309 (42.9) | 219 | 90 |         |
| Female                               | 410 (56.9) | 238 | 172 | 12.51 < 0.001 |
| Missing                              | 2 (0.3) |       |     |         |
| Residence status                     |       |         |     |         |
| Living in Okayama                    | 647 (89.7) | 413 | 234 |         |
| Moved to Okayama                     | 25 (3.5) | 12 | 13 |         |
| Live in another prefecture           | 44 (6.1) | 29 | 15 | 2.72 0.256 |
| Missing                              | 5 (0.7) |       |     |         |
| Marital status                       |       |         |     |         |
| Spouse/partner                       | 544 (75.5) | 361 | 183 |         |
| No                                   | 175 (24.3) | 97 | 78 | 6.84 0.009 |
| Missing                              | 2 (0.3) |       |     |         |
| Living situation                     |       |         |     |         |
| Live alone                           | 53 (7.4) | 32 | 21 |         |
| One housemate                        | 266 (36.9) | 189 | 77 |         |
| More than two                        | 384 (53.3) | 228 | 156 | 9.59 0.008 |
| Missing                              | 18 (2.5) |       |     |         |
| Working                              |       |         |     |         |
| Yes                                  | 524 (72.7) | 300 | 224 |         |
| No                                   | 188 (26.1) | 150 | 38 | 30.21 < 0.001 |
| Missing                              | 9 (1.2) |       |     |         |
| Annual personal income               |       |         |     |         |
| At diagnosis                         |       |         |     |         |
| Less than $20,000                    | 236 (32.7) | 138 | 98 |         |
| $20,000–$39,999                      | 192 (26.6) | 111 | 81 |         |
| More than $40,000                    | 155 (21.5) | 87 | 68 | 0.22 0.898 |
| Missing                              | 138 (19.1) |       |     |         |
| At time of study                     |       |         |     |         |
| Less than $20,000                    | 306 (42.4) | 180 | 126 |         |
| $20,000–$39,999                      | 140 (19.4) | 79 | 61 |         |
| More than $40,000                    | 100 (13.9) | 55 | 45 | 0.54 0.763 |
| Missing                              | 175 (24.3) |       |     |         |

OR odds ratio

Table 3  Patient clinical characteristics (1)

| Characteristics | N  | Mean (SD) |
|-----------------|----|-----------|
| Age at diagnosis|    |           |
| Male            | 308| 63.04 (10.2) |
| Female          | 405| 54.59 (11.3) |
| Cancer type     |    |           |
| Lung            | 131|          |
| Breast          | 201|          |
| Digestive tract | 144|          |
| Liver/bile duct | 47 |          |
| Pancreas        | 32 |          |
| Urogenital      | 39 |          |
| Gynecologic     | 56 |          |
| Head and neck   | 34 |          |
| Blood           | 77 |          |
| Others          | 26 |          |
| Multiple cancer diagnosis |   |           |
| No              | 656|          |
| Yes             | 59 |          |
| Missing         | 6 |            |

Table 4  Patient clinical characteristics (2) and results of univariate analysis

| Characteristics                      | Total | Request | OR | p value |
|--------------------------------------|-------|---------|----|---------|
|                                      | N (%) | No      | Yes |         |
| Treatment status                     |       |         |     |         |
| Currently receiving                 | 498 (69.1) | 328 | 170 |         |
| Under inspection                     | 192 (26.6) | 109 | 83 |         |
| Completed                            | 19 (2.6) | 10 | 9 | 5.83 0.054 |
| Missing                              | 12 (1.7) |       |     |         |
| Duration of cancer therapy           |       |         |     |         |
| Less than 6 months                   | 243 (33.7) | 149 | 94 |         |
| 6 months–1 year                      | 131 (18.2) | 81 | 50 |         |
| 1–2 years                            | 102 (14.1) | 67 | 35 |         |
| 2–3 years                            | 57 (7.9) | 33 | 24 |         |
| 3–5 years                            | 77 (10.7) | 51 | 26 |         |
| More than 5 years                    | 89 (12.3) | 58 | 31 | 1.84 0.872 |
| Missing                              | 22 (3.1) |       |     |         |

SD standard deviation, OR odds ratio
difficult for patients with cancer to allocate sufficient time to visit the hospital, whereas travel itself was a smaller burden.

As a demographic factor, age can be confounded by other factors, such as the higher likelihood of employment among younger patients. However, age remained significant in multivariate analysis, even after employment was eliminated as a potentially confounding factor. Although adolescents and young adults comprise a small percentage of patients with cancer, their medical needs are often unmet [15, 18] and specific types of support may be required [18, 19]. For example, adolescent and young adult patients may require greater effort to visit the farther and more specialized hospital [20, 21]. Younger patients have a larger social role and are thus likely to view outpatient hospital visits as burdensome, which would explain their interest in a weekend chemotherapy option.

Employment is also a major social consideration for patients with cancer [22], and employment itself has been shown to improve their QoL [23, 24]. Since 2012, the Japanese government has promoted opportunities for patients with cancer to continue employment or to be re-employed at their jobs, through the Basic Plan to Promote Cancer Control Program [25]. An equally common social problem of patients with cancer is income [26, 27], which is directly related to employment [28, 29]. Thus, the desire for weekend chemotherapy may have been linked to income. However, our data suggested that employment itself played a larger role than income in the desire for weekend chemotherapy. This might have been due to the importance of employment in Japan. Takahashi et al. found that, among Japanese patients with cancer, the main reasons for leaving a job were “I did not want to be a burden at my workplace,” “I anticipated a lack of energy and physical strength for work,” and “I was not confident that I could balance cancer treatment and work” [13]. These findings were presumed to reflect the greater value placed by Japanese patients with cancer on the impact of their treatment with respect to their employer and colleagues, rather than the loss of income due to lack of employment.

The patients in our survey reported that low effort was needed to visit the hospital. Several reports in other countries found that the effort needed to visit the hospital, such as the distance that had to be traveled, affected the prognosis. In Japan, the burden of visiting the hospital may be less than in other countries because of free access to the hospital and the relative ease of travel to local hospitals [21, 30].

Our study was based on an open-ended survey format with hundreds of respondents across multiple hospitals. However, our questionnaire-based approach had several limitations; therefore, our results may not be generalizable to all patients with cancer. Participants were treated at multiple cancer treatment centers, which may have confounded the results. Moreover, social factors are complex, and this survey did not consider all possible trends. It should also be noted that, despite patient interest in evening and weekend chemotherapy, adjustments to weekly chemotherapy availability may require additional medical staff, materials, and changes in the hospital work environment. While some hospitals are able to offer evening and weekend chemotherapy, this may not be feasible for all hospitals, as it would require major changes in their healthcare systems. However, our survey results may be of interest to institutions considering alternative treatment schedules.

In summary, the interest of patients with cancer in evening and weekend outpatient chemotherapy was influenced by age and employment status. Meeting this medical need may alleviate a social burden. Thus, along with efforts to reduce the physical side effects of chemotherapy, efforts should be expended to reduce the social burden, such as by providing evening and weekend outpatient chemotherapy.

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Compliance with ethical standards
Ethics declarations This survey was approved by Institutional Review Boards of all participating hospitals.

Conflict of interest The authors declare that they have no conflict of interest.

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