医薬品相互作用研究
一　般　論　文
41(1) 17-25（2017）

How hospitals collaborate in cancer care with community pharmacies in the prescription of oral chemotherapy drugs

Kazuhiro WATANABE[1)]*, Hirohisa DOI[1)], Miyuku CHISIMA[2)], Youji HIRAKO[3)], Keiji YOSHIKAWA[3)], Kazuhiro AGATA[2)], Miya OISHI[3)], Masayoshi HIROHARA[1)], Michiko YAMAMOTO[1)], and Masayoshi KOINUMA[4)]

[1)] Center for Education & Research on Clinical Pharmacy, Showa Pharmaceutical University
[2)] Qol Co., Ltd. [3)] Ain Pharmaciez Inc. [4)] Teikyo Heisei University

（Received May 30, 2016; Revised August 31, 2016; Accepted September 21, 2016）

The number of prescriptions issued for oral chemotherapy drugs has been increasing in recent years. In light of this increase, it is desirable from the standpoint of medical safety for medical facilities that issue prescriptions to collaborate in cancer care with community pharmacies by sharing information about patients or cancer treatment plans. Therefore, we conducted a national-scale survey with community pharmacies that fill prescriptions for oral chemotherapy drugs to determine how facilities that issue prescriptions collaborate in cancer care with community pharmacies, what pharmaceutical inquiries community pharmacists make, and how community pharmacists would like hospital pharmacists at these facilities to check prescriptions. An online survey was sent to pharmacists in every location of 2 community pharmacy chains with locations across Japan. A total number of 53 community pharmacies that filled prescriptions for oral chemotherapy drugs responded that they collaborated in cancer care with facilities that issue prescriptions. However, 210 pharmacies had made a pharmaceutical inquiry about an oral chemotherapy drug to the prescribing facility. In addition, 446 pharmacies wanted hospital pharmacists at these facilities to check oral chemotherapy drug prescriptions. These results should aid further research on how community pharmacies and medical facilities collaborate in cancer care.

Key Words: oral chemotherapy drug, collaboration between hospitals and community pharmacies, collaboration in cancer care, prescription checking, survey of actual conditions

Introduction

In recent years, there has been a rising social need to implement collaborative medical care systems designed to ensure continuity and consistency between hospital care and post-discharge in-home medical care. In the field of cancer care, the expansion of outpatient chemotherapy and adoption of oral chemotherapy drugs have made systems for collaboration between medical facilities and community pharmacies essential for ensuring that patients undergoing chemotherapy receive safe and reliable treatment and for improving patient adherence. In the past few years, there have been reports of some medical facilities and regions building collaborative systems for medical facilities to share patient information and information about chemotherapy regimens with community pharmacies.[1-7)] However, in general, the only information that most community pharmacies use when checking and dispensing prescriptions for oral chemotherapy drugs is information that can be obtained by asking patients and information listed in the dosage and administration section of package inserts. This suggests that most community pharmacies make pharmaceutical inquiries about oral chemotherapy drugs from facilities that issue prescriptions because they have difficulty gathering information about patients and

[1)] Center for Education & Research on Clinical Pharmacy, Showa Pharmaceutical University, 3-3165 Higashi-Tamagawagakuen, Machida-shi, Tokyo 194-8543, Japan
[2)] Qol Co., Ltd.,
[3)] Ain Pharmaciez Inc.,
[4)] Teikyo Heisei University
*連絡著者：渡部　一宏（E-mail: kazunabe@ac.shoyaku.ac.jp）

chemotherapy regimens, for example, whether the patient has been informed that they have cancer, their treatment status, patient information such as test results, and information about what chemotherapy regimens the patient has undergone.

Therefore, we conducted a national-scale survey to determine how community pharmacies collaborate in cancer care with facilities that issue prescriptions for oral chemotherapy drugs. We also sought to ascertain what pharmaceutical inquiries community pharmacists make about oral chemotherapy drugs, and how community pharmacists would like hospital pharmacists at these facilities to check prescriptions for oral chemotherapy drugs.

Methods

Study population

This study was a cross-sectional study using a self-completed questionnaire. The participants were supervising pharmacists at community pharmacies operated by QOL Co., Ltd. and Ain Holdings, Inc., who had filled a hospital-issued prescription including oral chemotherapy drugs within the past year. An explanation of the nature of the study and its objectives was sent to the supervising pharmacist at each pharmacy by email. Pharmacies that consented to participate in this study submitted a self-completed questionnaire online. The study period was from June 1 to July 31, 2014.

Research instruments

1. Collaboration in cancer care with facilities that issue prescriptions for oral chemotherapy drugs

Regarding collaboration in cancer care with facilities that issue prescriptions for oral chemotherapy drugs, respondents were asked, "Question 1: Does your pharmacy collaborate in cancer care with facilities that issue prescriptions for oral chemotherapy drugs (excluding pharmaceutical inquiries about prescriptions)?" They could answer "yes" or "no". Pharmacies that answered "yes" were asked for further details.

Stratified analysis was also performed to explore the association between the number of oral chemotherapy drug prescriptions filled by a pharmacy and whether that pharmacy collaborated in cancer care with facilities that issue prescriptions. Pharmacies were divided into 3 groups by the number of oral chemotherapy drug prescriptions filled: below the first quartile (1 or fewer), interquartile range (between first and third quartiles; 2 to 19), and above the third quartile (20 or more). Statistical testing was performed to determine whether there was a difference in collaboration in cancer care between these groups.

Stratified analysis was also performed to explore the association between the location of a pharmacy and whether that pharmacy collaborated in cancer care with facilities that issue prescriptions. Pharmacies were divided by location into 6 regional groups: Hokkaido, Tohoku, Kanto, Chubu, Kinki, and Shikoku/Chugoku/Kyushu/Okinawa. Statistical testing was performed to determine whether there was a difference in collaboration in cancer care between these groups.

2. Pharmaceutical inquiries about prescriptions for oral chemotherapy drugs

Regarding pharmaceutical inquiries about prescriptions for oral chemotherapy drugs, respondents were asked, "Question 2: Have you ever made a pharmaceutical inquiry about an oral chemotherapy drug to the facility that issued the prescription?" They could answer "yes" or "no". Pharmacies that answered "yes" were asked for further details.

Stratified analysis was also performed to explore the association between the number of oral chemotherapy drug prescriptions filled by a pharmacy and pharmaceutical inquiries to facilities that issue prescriptions. Pharmacies were divided into 3 groups by the number of oral chemotherapy drug prescriptions filled: below the first quartile (1 or fewer), interquartile range (2 to 19), and above the third quartile (20 or more). Statistical testing was performed to determine whether there was a difference in pharmaceutical inquiries to facilities that issue prescriptions between these groups.

Stratified analysis was also performed to explore the association between the location of a pharmacy and pharmaceutical inquiries to facilities that issue prescriptions. Pharmacies were divided by location into 6 regional groups: Hokkaido, Tohoku, Kanto, Chubu, Kinki, and Shikoku/Chugoku/Kyushu/Okinawa. Statistical testing was performed to determine whether there was a difference in

pharmaceutical inquiries to facilities that issue prescriptions between these groups.

3. Desire for hospital pharmacists to check prescriptions against chemotherapy regimens

Regarding their desire for hospital pharmacists to check prescriptions against chemotherapy regimens, respondents were asked, “Question 3: Would you like hospital pharmacists to check prescriptions against chemotherapy regimens?” They could answer “yes” or “no”. Pharmacies that answered “yes” were asked for the specific items that they would like to have checked against chemotherapy regimens.

Questions about the characteristics of the supervising pharmacists and pharmacies that responded were also asked at the same time.

4. Statistical analysis

Data analysis was primarily performed using descriptive statistics. The chi-square test was used to compare the results of stratified analysis. A two-sided significance level of 5% was used. IBM SPSS Statistics 20.0 was used for statistical analysis.

5. Ethical considerations

The research protocol was prepared in compliance with ethical guidelines for epidemiological research. The protocol was approved by the research ethics committee of Showa Pharmaceutical University (2014-6 and 2014-9).

Results

Study population

Responses were obtained from 458 pharmacies in 2 community pharmacy chains with locations across Japan. The pharmacies that responded filled a median of 1,500 prescriptions per month (interquartile range: 900–2,200) and 4 prescriptions for oral chemotherapy drugs per month (interquartile range: 1–20). They employed a median of 3 pharmacists (range: 2–5). The responding community pharmacies were located in 35 prefectures across Japan. There were 45 in Hokkaido, 52 in Tohoku, 222 in Kanto, 77 in Chubu, 39 in Kinki, and 23 in Chugoku/Shikoku/Kyushu/Okinawa (Table 1).

Table 1. Respondent characteristics (n = 458)

Variable	All (n=458)
Characteristics of respondents’ pharmacies	
Median number of prescriptions filled per month — no. (ICQ)	1,500 (900–2,200)
Median number of oral chemotherapy drug prescriptions filled per month — no. (ICQ)	4 (1–20)
Median number of pharmacists employed (full-time) — no. (ICQ)	3 (2–5)
Community pharmacy location (region)	
Hokkaido — no. (%)	45 (10)
Tohoku — no. (%)	52 (11)
Kanto — no. (%)	222 (48)
Chubu— no. (%)	77 (17)
Kinki — no. (%)	39 (9)
Chugoku / Shikoku / Kyushu / Okinawa — no. (%)	23 (5)

ICQ: Interquartile range

Research instruments

1. Collaboration in cancer care with facilities that issue prescriptions for oral chemotherapy drugs

When asked if they collaborated in cancer care with facilities that issue prescriptions for oral chemotherapy drugs (excluding pharmaceutical inquiries about prescriptions), 12% of pharmacies (n = 53) answered “yes” and 88% (n = 405) answered

"no".

Of the 53 pharmacies that answered "yes", 26 shared patient information through prescription records or drug management summaries and 29 exchanged information about pharmacotherapy (e.g., about chemotherapy regimens) with facilities that issue prescriptions for oral chemotherapy drugs (Fig. 1).

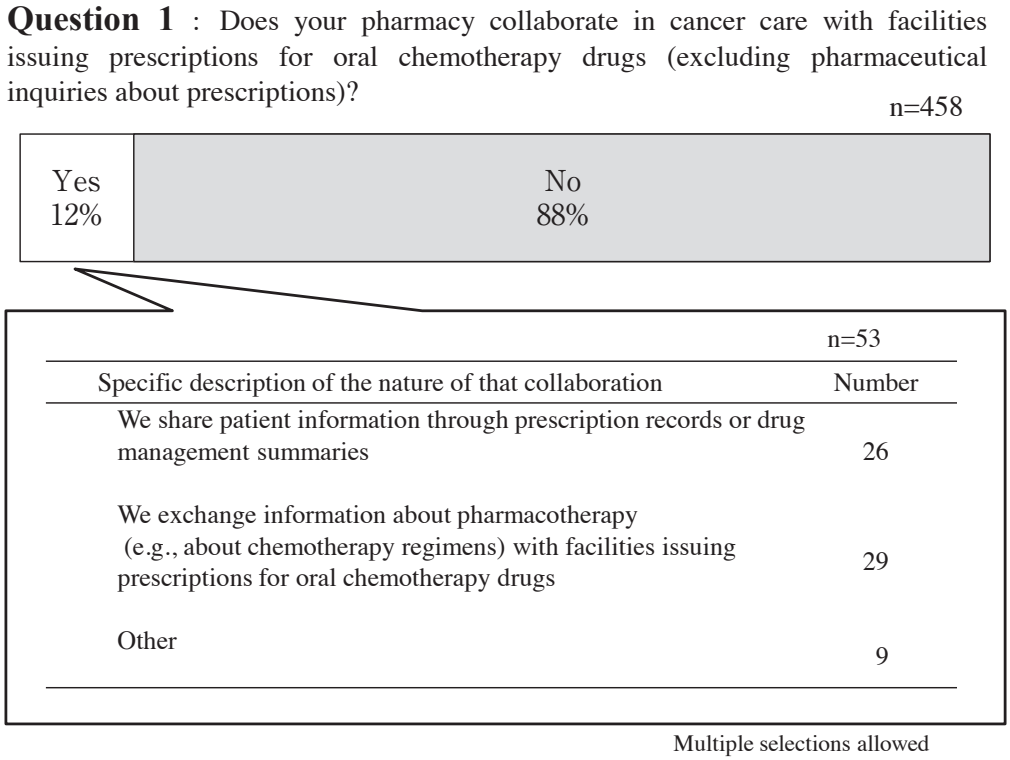


Fig. 1. Collaboration in cancer care with facilities that issue prescriptions for oral chemotherapy drugs

The results of stratified analysis on the association between the number of oral chemotherapy drug prescriptions filled by a pharmacy and whether that pharmacy collaborated in cancer care with prescribing facilities are shown in Table 2. There was a significant difference in collaboration in cancer care between the 3 groups divided by the number of oral chemotherapy drug prescriptions filled (p = 0.008).

The results of stratified analysis to explore the association between the location of a pharmacy and whether that pharmacy collaborated in cancer care with prescribing facilities are shown in Table 3. There was no significant difference in collaboration in cancer care between the 6 groups divided by location (p = 0.06).

Table 2. Association between number of prescriptions for oral chemotherapy drugs filled and collaboration in cancer care with facilities that issue prescriptions

		Number of oral chemotherapy drug prescriptions filled per month (no.)			*p value*
		< = 1	2 - 19	> = 20	
Collaboration in cancer care	Yes	7 (5%)	16 (9%)	30 (23%)	0.008*
	No	144 (95%)	159 (91%)	102 (77%)	

*: p<0.05
Independent chi-square test

Table 3. Association between pharmacy location and collaboration in cancer care with facilities that issue prescriptions

		Community pharmacy location (Region)						*P value*
		Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku / Shikoku / Kyushu / Okinawa	
Collaboration in cancer care	Yes	2 (4%)	12 (23%)	21 (9%)	10 (13%)	6 (15%)	2 (9%)	0.06
	No	43 (96%)	40 (77%)	201 (91%)	67 (87%)	33 (85%)	21 (91%)	

*: $P<0.05$
Independent chi-square test

2. Pharmaceutical inquiries about prescriptions for oral chemotherapy drugs

When asked if they had ever made a pharmaceutical inquiry about an oral chemotherapy drug to the facility that issued the prescription, 46% of pharmacies (n = 210) answered "yes" and 54% (n = 248) answered "no".

Among the 210 pharmacies that answered "yes", the most common topics of inquiry regarding oral chemotherapy drugs were "rest period" at 132, "administration period" at 122, and "dosage and administration" at 116 (Fig. 2).

Question 2 : Have you ever made a pharmaceutical inquiry about an oral chemotherapy drug to the facility that issued the prescription?

n=458

n=210

Specific topics of inquiry	Number
Rest period	132
Administration period	122
Dosage and administration	116
Interactions with concomitant drugs	15
Drug names	12
Confirm supportive care	6
Other	6

Multiple selections allowed

Fig. 2. Pharmaceutical inquiries about prescriptions for oral chemotherapy drugs

The results of stratified analysis on the association between the number of oral chemotherapy drug prescriptions filled by a pharmacy and whether that pharmacy made pharmaceutical inquiries to prescribing facilities are shown in Table 4. There was a significant difference in the percentage of pharmacies that made inquiries to prescribing facilities between the 3 groups divided by number of oral chemotherapy drug prescriptions filled (p = 0.001).

Table 4. Association between number of prescriptions for oral chemotherapy drugs filled and pharmaceutical inquiries to facilities that issue prescriptions

		Number of oral chemotherapy drug prescriptions filled per month (no.)			*p value*
		< = 1	2 - 19	> = 20	
Pharmaceutical inquiries about prescriptions for oral chemotherapy drugs	Yes	41 (27%)	82 (47%)	87 (66%)	0.001*
	No	110 (73%)	93 (53%)	45 (34%)	

*: p<0.05
Independent chi-square test

The results of stratified analysis on the association between the location of a pharmacy and whether that pharmacy made pharmaceutical inquiries to prescribing facilities are shown in Table 5. There was no significant difference in the percentage of pharmacies that made inquiries to prescribing facilities between the 6 groups divided by location (p = 0.09).

Table 5. Association between pharmacy location and pharmaceutical inquiries to facilities that issue prescriptions

		Region						*p value*
		Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku / Shikoku / Kyushu / Okinawa	
Pharmaceutical inquiries about prescriptions for oral chemotherapy drugs	Yes	19 (42%)	28 (54%)	93 (42%)	37 (48%)	25 (64%)	8 (35%)	0.09
	No	26 (58%)	24 (46%)	129 (58%)	40 (52%)	14 (36%)	15 (65%)	

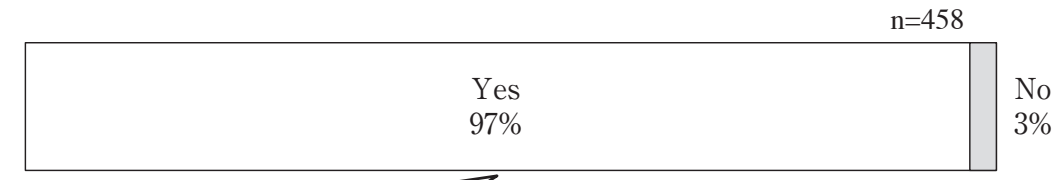
*: p<0.05
Independent chi-square test

3. Desire for hospital pharmacists to check prescriptions against chemotherapy regimens

When asked if they would like hospital pharmacists to check prescriptions against chemotherapy regimens, 97% of pharmacies (n = 446) answered “yes” and 3% (n = 12) answered “no”.

Among the pharmacies that answered “yes”, the specific items they indicated that they would like to be checked were “rest period” at 385, “administration period” at 376, and “dosage and administration” at 385 (Fig. 3).

Question 3 : Would you like hospital pharmacists to check prescriptions against chemotherapy regimens?



n=446

Specific topics of inquiry	Number
Rest period	385
Administration period	376
Dosage and administration	385
Interactions with concomitant drugs	254
Drug names	178
Confirm supportive care	169
Other	40

Multiple selections allowed

Fig. 3. Desire for hospital pharmacists to check prescriptions against chemotherapy regimens

Discussion

In this study, we conducted a survey with pharmacies of 2 community pharmacy chains with locations across Japan to determine how community pharmacies collaborate in cancer care with facilities that issue prescriptions for oral chemotherapy drugs, what pharmaceutical inquiries community pharmacists make about oral chemotherapy drugs, and how community pharmacists would like hospital pharmacists at these facilities to check prescriptions for oral chemotherapy drugs. The survey yielded several findings.

Our first finding was that 12% of the community pharmacies collaborated in cancer care with facilities that issue prescriptions for oral chemotherapy drugs. As part of an annual survey on current hospital pharmacy practice, the Japanese Society of Hospital Pharmacists (JSHP) asks supervising pharmacists at outpatient chemotherapy departments of hospitals whether they shared information about chemotherapy with community pharmacies. In 2014, the percentage that responded “yes” was 31% [8]. One reason for this difference may be that the JSHP surveyed hospital pharmacists and we surveyed community pharmacists, because each group may have a different perception of what it means for hospital pharmacists and community pharmacists to collaborate in cancer care.

Stratified analysis on the association between the number of oral chemotherapy drug prescriptions filled by a pharmacy and whether that pharmacy collaborated in cancer care with facilities that issue prescriptions revealed a difference in collaboration in cancer care between the 3 groups divided by the number of oral chemotherapy drug prescriptions filled. Pharmacies that filled more prescriptions for oral chemotherapy drugs were more likely to collaborate in cancer care. We believe this may be because prescribing facilities are more likely to collaborate with the pharmacy that fills the most prescriptions for their facility, which would be the pharmacy located right outside the facility (called monzen-yakkyoku in Japanese).

The number of medical facilities adding patient test result data or chemotherapy regimen data to prescriptions has gradually been increasing over the past few years, especially among university hospitals. However, this increase has been regional rather than national. Facilities that issue prescriptions should utilize government-driven information and

communication technology programs to quickly build regional networks so that they can share medical information about patients and chemotherapy regimens with pharmacies regionally and even nationally rather than simply to the monzen-yakkyoku pharmacy or local pharmacies [9]. However, some issues such as high cost, respect for privacy, and protection of personal information will need to be resolved.

Our second finding was that 46% of pharmacies had made a pharmaceutical inquiry about an oral chemotherapy drug prescription to the facility that issued the prescription, and that the most common information requested was pharmaceutical information about the rest period, administration period, and dosage and administration of the chemotherapy drugs as they applied to a specific chemotherapy regimen. We believe this reflects that even community pharmacies are now filling more prescriptions for oral chemotherapy drugs due to factors such as recent advances in medical technology for outpatient chemotherapy, the increased use of molecularly targeted drugs and other oral chemotherapy drugs with new mechanisms of action. This finding, which is consistent with results from related studies, was likely due to a lack of knowledge about chemotherapy and chemotherapy regimens and insufficient collaboration with facilities that issue prescriptions [10-12].

Our third and last finding was that 97% of community pharmacies wanted hospital pharmacists to check prescriptions against chemotherapy regimens. This could also be due to a lack of collaboration in cancer care with facilities that issue prescriptions, but could also be due to community pharmacists finding it difficult to obtain all the information they need to check and fill prescriptions for oral chemotherapy drugs at a community pharmacy. We found that the items about prescriptions that community pharmacists wanted hospital pharmacists to check against chemotherapy regimens were similar to the information that they requested about oral chemotherapy drugs in pharmaceutical inquiries. This finding, too, indicates that community pharmacists have a strong desire for hospital pharmacists to check prescriptions against chemotherapy regimens. A related previous study showed that only 12% of designated cancer care hospitals have a hospital pharmacist check oral chemotherapy drug prescriptions that will be filled outside the hospital against chemotherapy regimens. The authors concluded that this was because this kind of check was a time-consuming task for hospital pharmacists [13]. However, the JSHP Guidelines for the Handling of High-risk Drugs (Ver. 2.1) state that it should be standard protocol to check both inpatient and outpatient prescriptions for antineoplastics against regimens, and propose that having hospital pharmacists at prescription-issuing facilities check oral chemotherapy drug prescriptions against chemotherapy regimens could be a strategy for nationwide collaboration in cancer care between facilities issuing prescriptions and community pharmacies.

Our study has some limitations. As we surveyed only those pharmacies operated by QOL Co., Ltd. and Ain Holdings, Inc., our sample may not be representative of all community pharmacies. Nevertheless, our study is significant because it provides up-to-date, nationwide information on how hospitals are collaborating in cancer care with community pharmacies in the prescription of oral chemotherapy drugs in Japan. We believe these results will serve as a foundation for further nationwide research on collaboration in cancer care in the prescription of oral chemotherapy drugs.

Acknowledgements

This study was conducted as a part of the “Heisei 26 Nendo Wakate-Kenkyu-sya Jyosei” funded by Showa Pharmaceutical University of Japan (No. H 26-4). We greatly appreciate the cooperation of the community-based pharmacies involved in this study.

References

1) Kimura S, Ibaraki M, Aya S, Morimoto T, Fukuda Y, Michishita K, Tatsuno M: A Study of Methods for Acquiring lnformation about Chemotherapy Provided by Communit Pharmacies: Results from a Questionnaire Survey Conducted by the Hirakata city Pharmaceutical Association. J. Jpn. Soc. Hosp. Pharm., 45, 85-388, 2009.

2) Takano R, Takahashi K, Asano J, Sasaki H, Sakuta S, Sekizawa Y, Oe T: Safety Management of Chemotherapy with Tegafur/Gimeraci1/Oteracil Potassium and Capecitabine Using a Drug-Use Diary. J. Jpn. Soc. Hosp. Pharm., 47, 583-587, 2011.

3) Ueda H, Kurahashi M, Nakao Y, Nishida S,

Tsukamoto Y, Inoue N, Hamaguchi Y: The Usefulness of Sharing Information on Oral Chemotherapy Regimens for Cancer Patients through Cooperation between Hospital Pharmacies and Community Drugstores. J. Jpn. Soc. Hosp. Pharm., 48, 356-359, 2012.

4）Goto E, Taira S, Hosomi M, Maki C, Nishihara M, Katsumata: The Significance of Cooperation between Community Pharmacists and Hospital Pharmacists using a Medication Notebook：Questionnaire about Sharing Cancer Chemotherapy lnformation between Pharmacists in Takatsuki City. J. Jpn. Soc. Hosp. Pharm., 49, 641-647, 2013.

5）Satoh H, Miki A, Maejima K, Iizuka K, Yamaga S, Sakashita K, Takano Y, Takahashi Y, Tajiri K, Takechi Y, Shimada M, Suzuki M, Sawada Y: Problems of Collaboration between Community and Hospital Pharmacists for Cancer Chemotherapy and Proposed Corrective Measures: KJ Method Based Identification and Planning Workshop. YAKUGAKU ZASSHI, 134, 563-574, 2014.

6）Kawazoe H, Ueno M, Sumikawa S, Tanaka M, Tanaka A, Araki H: Evaluation of Bidirectional Sharing of Patient Information for S-1 between Hospitals and Community Pharmacies using a Modified Prescription Format. Japanese Journal of Pharmaceutical Health Care and Sciences, 40, 441-448, 2014.

7）Tsuzuki M, Tanaka M, Kato K, Tanaka A, Araki H: An Investigation on Bidirectional Sharing of Drug Information between Community and Hospital Pharmacists: An Attempt at a Medication Notebook and a Medicine Message Board. J. Jpn. Soc. Hosp. Pharm., 52, 273-276, 2015.

8）Activity Report of the General Affairs Department, Japanese Society of Hospital Pharmacists: Aggregate Report from the 2014 Survey of Hospital Pharmacy Practice, J. Jpn. Soc. Hosp. Pharm., 51, 613-683, 2015.

9）Miyazaki Y: Regional Medical Care Coordination – What is the Best way for Pharmacistd to Work with the Community? YAKUGAKU ZASSHI, 133, 337-341, 2013.

10）Terui K, Sato J, Tamada M, Hayakari M: A Survey and Advanced Approach for Cooperation between Hospital and Community Pharmacies for Outpatient Antineoplastic Chemotherapy. J. Jpn. Soc. Hosp. Pharm., 44, 424-427, 2008.

11）Nakajima T, Nakane S, Suzuki Y, Morishita M, Kawai K, Itoh S, Yamamoto T, Sano Y, Saitoh H, Hasegawa S: Questionnaire Survey on Communication between Hospital and Community Pharmacies in Outpatient Chemotherapy. J. Jpn. Soc. Hosp. Pharm., 45, 1621-1624, 2009.

12）Fujita Y, Hori S, Satoh H, Miki A, Sawada Y: Actual Condition Survey on Dispensing of Oral Anti-cancer Drug. Japanese Journal of Pharmaceutical Health Care and Sciences, 39, 741-749, 2013.

13）Sakurai H, Suzuki S, Kawasumi K, Endo K: Survey of Pharmacists Involved in Cancer Treatment in Cancer Medicine Cooperation Base Hospitals. Japanese Journal of Pharmaceutical Health Care and Sciences, 39, 717-725, 2013.