

Association of treatment and outcomes of doctor-shopping behavior in patients with hepatocellular carcinoma

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Background: A variety of unfulfilled needs may trigger doctor-shopping behavior (DSB) in patients. In oncology, treatment results usually cause patients the most concern. This study investigated the association of DSB with active treatments received by patients with hepatocellular carcinoma (HCC) and outcomes.

Methods: With approval from the institutional review board, all patients registered in the cancer database of a teaching hospital and diagnosed as having HCC by self-referral from outside hospitals or by in-house diagnosis were retrospectively identified. Patient data were then reviewed and analyzed via electronic medical records.

Results: Hepatitis B carriers were significantly more likely than noncarriers to show first-time DSB. Recurrent disease was less likely to result in DSB than predicted. Patients from outside hospitals not receiving upfront first treatment after diagnosis were significantly more likely to show more frequent DSB than those receiving it. Male patients eligible for salvage treatment were less likely to have frequent occurrences of DSB than their female counterparts. Receiving first salvage treatment was not associated with more frequent DSB. Treatment recommendations offered in the study hospital did not influence patients' decisions to leave or stay. Only elderly patients (>70 years) were less likely to show DSB.

Conclusion: DSB can occur throughout the entire course of treatment for HCC for a variety of reasons. Active treatments, disease status, and patient characteristics all exerted an influence on DSB.

Keywords: doctor-shopping behavior, second opinion, hepatocellular carcinoma

Introduction

Physician-initiated second opinion (SO) and doctor-shopping behavior (DSB) are common phenomena in patients for various reasons. No prior research has differentiated DSB and SO, but both are recognized as behaviors of searching for information on diagnoses, treatment options, and outcomes, which may assist with the management of patients' own health.¹ Although data on incidence rates are lacking, according to surveys, DSB occurs in all fields of medicine and has rapidly gained popularity.^{2,3} One series reported 16% of US patients as seeking a second medical opinion.⁴ In Europe, the field of elective surgery has initiated SO evaluations.⁵⁻⁸ Despite their significance, research on SO and DSB is limited, and may differ according to specialties, diseases, culture, and health systems.

In Taiwan, Western medicine was introduced by a missionary in 1865. After World War II, Taiwan was ceded to Japan, and Western medicine was consolidated as a fundamental health care system from 1899 to 1936. The traditional patient-physician

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relationship in Japan has often been described as hierarchical and paternalistic compared with Western countries.^{9,10} Japanese physicians usually do not discuss treatment options and the details of procedures with patients.¹¹ Because of this background, Taiwanese patients always believed and trusted medical authority figures until the recent introduction of consumerism, informed consent, patient autonomy, and other concepts pertaining to human rights. This evolution may also increase DSB. In general, Taiwanese patients typically visit a physician or an outpatient department frequently. Many patients not only consult several physicians of different specialties at different health care facilities, but also switch them rapidly.¹²

Patients may consult other doctors for various reasons. Attributable patient factors include the patient's dissatisfaction with¹³⁻¹⁵ or distrust of^{14,16,17} a doctor, concerning the critical diagnosis, poor prognosis and difficult treatments,^{2,3,18} or the patient feeling insufficient time has been provided for discussion.¹⁹ Other factors include personal beliefs, religious dogma,²⁰ the desire to be more informed,²¹ the patient's educational background,¹⁷ gender,^{1,22} health status,^{1,14,23} and hospital stay.¹⁴ Doctor factors that influence DSB include the doctor's professional knowledge and skills,²⁴ personal characteristics (such as age and race), and attitudes.^{24,25} Other factors include traffic convenience,^{16,24} waiting time,²⁴ verbal recommendations from others,²⁶ reputation of an institution,¹⁶ medical fees,²⁶ the doctor's affiliation with a medical group,²⁶ and patient-doctor communication.^{15,17,27}

The appeal of DSB is that it is a strategy for coping with medical uncertainty. Alternatively, it is caused by distrust in physicians or the system. By seeking second opinions and making lay consultations, patients hope to understand the prognosis of a disease and to choose an institution for treatment.²⁸ This reflects that patients actively participate in the medical care process. Although DSB is regarded as a function of safeguarding against undesirable outcomes from the patient's perspective, limited medical care resources make DSB a stigma among health professionals and policymakers because it causes utility loss, discontinuity of care, and unequal distribution of medical resources.

Most studies on DSB have focused on behaviors occurring either before or immediately after the initial diagnosis. In the former, DSB may occur if a patient's early symptoms cannot be explained or alleviated before the real causes are defined.²⁹ Although study designs may vary, a non-life threatening illness may underestimate patients' DSB compared with other critical diseases. A disappointing outcome is one of the most significant reasons for seeking a second opinion.²¹ Especially

when addressing malignancy, treatment failure remains the major concern for patients and family.³⁰ A research study has yet to address this issue. Prior studies have focused on the initial phase of disease, without a longitudinal follow-up after treatment for cancer. This may limit our understanding of patient behavior, and fail to address the multiple DSB observed in the real world.

To address the gaps in the literature, this pilot study aimed to evaluate the relationship between DSB and treatments and/or results of hepatocellular carcinoma (HCC), a prevailing cancer related to endemic viral hepatitis in Taiwan. According to the Department of Health, hepatitis B carriers presently account for approximately 15% of the entire population of Taiwan. Annual incidence and mortality rates for HCC ranked third and second of all malignancies in 2007 and 2009, respectively.³¹

Materials and methods

Data collection

Between January 2005 and December 2007, a total of 358 cases of HCC (ICD 9 code number 155.0 and 155.2) diagnosed, treated, referred to, or followed up at one study teaching hospital were identified from the in-house cancer registry database. Electronic medical records of 357 patients were reviewed (one record was excluded because of insufficient data) to examine the association between defined factors and the occurrence of DSB. Patients self-referred from outside hospitals were regarded as class 2 patients and other patients were regarded as class 1 patients. The date of the last electronic medical record was July 31, 2010. This study was approved by the appropriate institutional review board (TMUH 01-11-03) and performed accordingly.

Definition of determinants

When analyzing the hospital electronic medical records for class 2 patients, DSB was recognized as paying visits to other hospitals or transferring from hospital to hospital. In class 1 patients, DSB was regarded as leaving for SO after diagnosis, treatment, and/or during follow-up. In class 2 patients, the number of DSB could be counted according to the transfer note. Nonetheless, for both classes, if a patient left our institution, the information and extent of DSB was recorded as follows: a patient was alive but out of contact with the doctor for more than three months, with no available electronic medical record; patients or families returned for a certificate or medical summary that reported referral institutions; and patients who left but returned to our institution for medical problems other than HCC, and the institutions they had

visited. The number of DSB (continuous dependent variable) was recorded accordingly. All clinical information retrieved was categorized into three levels of determinants that may affect DSB. Patient determinants consisted of gender, age, marital status, and level of education. Disease determinants were hepatitis profile, family history of malignancy, and/or hepatitis. Treatment determinants included: recurrence (nominal independent variable), defined as newly developed or persistent intrahepatic lesions requiring locoregional treatment (such as surgery, radiofrequency ablation, percutaneous ethanol injection, transarterial chemoembolization, radiotherapy); progression (nominal independent variable), defined as detection of newly developed extrahepatic metastases, failure of locoregional treatment, and/or initiation of systemic treatments as a salvage strategy or supportive care; upfront first treatment (nominal independent variable), defined as the initial active treatment received by all patients following a cancer diagnosis (Figure 1); salvage treatment (nominal independent variable), defined as the treatment received by patients in recurrent or progressive disease states; and first treatment in-house (nominal independent variable), defined as the first treatment received in the study teaching hospital. Supportive care was not included as treatment in the analysis.

Data analysis

To evaluate the significance of all determinants in relation to DSB, frequency tables were prepared and the Chi-squared test was applied. After adjusting for the confounding effects of patients and diseases, the associations between treatment determinants and DSB were analyzed based on various hypotheses and tested in multivariate logistic regression models. All *P*-values reported were obtained from two-sided tests. Statistical significance was set at *P* < 0.05. All analyses were performed using SAS version 9.2 (SAS Institute Inc, Cary, NC, USA).

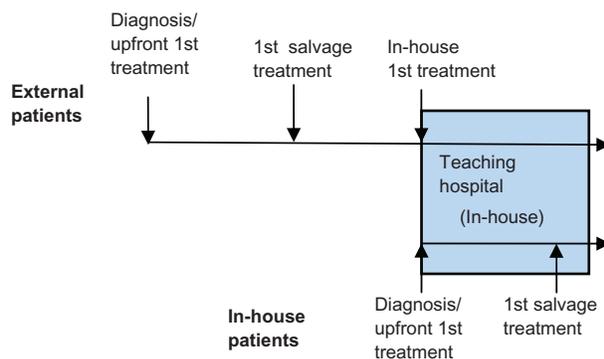


Figure 1 Treatment at different decision points.

Results

Descriptive statistics

As shown in Table 1, the majority of patients (77.3%) were middle-aged to elderly. Four fifths were men and 56% were chronic hepatitis B carriers. Class 1 and class 2 patients accounted for 22.1% and 77.9% of all patients, respectively. Married (78.4%) and poorly educated (51.8%) patients were the predominant subgroups. History of hepatitis or HCC in the family was noted in 13.4% of all cases. Among these, 21.5% of class 1 and 28.8% of class 2 patients left the study institution and undertook DSB. One third of patients reported

Table 1 Characteristics of determinants

Variable	n = 357	%
Gender		
Male	286	80.1
Female	71	19.9
Mean age (years)	56	
<50	81	22.7
51–70	190	53.2
>70	86	24.1
Hepatitis		
B	200	56.0
C	82	23.0
B + C	16	4.5
None	44	12.3
Unknown	15	4.2
Marital status		
Married	280	78.4
Unmarried	37	10.4
Divorced/widowed	22	6.2
Unknown	18	5.0
Education		
College and above	52	14.6
High school	71	19.9
Middle school	75	21.0
Elementary/illiterate	110	30.8
Unknown	49	13.7
Family history		
None/not known	288	80.7
Hepatitis/HCC	48	13.4
Other cancers	21	5.9
First institution		
In-house (class 1)	79	22.1
External (class 2)	278	77.9
Number of DSB		
None	44	12.3
Once	118	33.1
More than once	195	54.6
Progressive disease	81	22.6
Recurrent disease	130	36.4
Upfront first treatment	306	85.7
In-house first treatment	212	59.3
Salvage treatment	147	41.1

Abbreviations: DSB, doctor-shopping behavior; HCC, hepatocellular carcinoma.

DSB once, whereas 54.6% reported doing so more than once. The three foremost reasons for class 2 patients to visit this teaching hospital were high-technology treatments (18.7%, eg, cryotherapy, stereotactic radiotherapy, targeted agents), followed by confirmation of diagnosis (9.0%) and treatment options (8.7%).

Statistical inferences

The present study hypothesized that patients with recurrent or progressive HCC would be prone to first-time DSB, and patients who accepted their upfront first treatments would have a lower probability of first-time DSB. However, as shown in multivariate analyses (Table 2), disease progression ($P = 0.663$) and receiving of upfront first treatment

($P = 0.854$) were not significantly associated with the occurrence of first-time DSB. On the contrary, HCC patients with recurrence were less likely to undertake first-time DSB (odds ratio [OR] 0.411, $P = 0.012$). Compared with noncarriers, hepatitis B carriers also had a significantly higher probability of first-time DSB (OR 2.532, $P = 0.040$).

Intuitively, receiving treatment after diagnosis usually implies that a relationship between a physician and patient has been established. This can reduce the likelihood of future DSB. In contrast, avoiding receiving salvage treatment for disease recurrence or progression may increase the likelihood of single or multiple DSB. Therefore, the present study hypothesized that, in class 2 patients, receiving upfront first or first salvage treatment would reduce the number of DSB. In bivariate analysis, both upfront first treatment and first salvage treatment were significantly associated with the amount of DSB (once versus more than once). However, logistic model analysis identified that only patients not receiving upfront first treatment undertook multiple DSB (OR 0.435, $P = 0.029$, Table 3). In 107 (38.48%) class 2 patients with progression and/or recurrence who were eligible for first salvage treatment, subgroup reanalysis showed that receiving upfront first treatment or first salvage treatment did not significantly influence the extent of DSB ($P = 0.921$ and 0.983 , respectively, Table 4). Among these patients, men were less likely to show DSB on more than one occasion than their female counterparts (OR 0.026, $P = 0.010$).

When physicians recommended a new in-house treatment, all patients had to decide whether to stay with or leave the study institution (Figure 1, shaded box). The treatment may or may not have been appropriate for their condition or fulfilled their needs. Hence, the present study hypothesized that, at this stage, new DSB may relate to rejection of the treatment suggestion. As determined in bivariate analysis, first in-house treatment, age <50 years, and recurrence were significantly associated with patient decision-making. However, among these factors, more elderly (age >70 years) patients were likely to stay with the study hospital (OR 0.270, $P = 0.022$, Table 5) than younger (age <50 years) patients. Similarly, patients receiving their first in-house treatment were more likely to remain at the study hospital, but this was of borderline significance (OR 0.593, $P = 0.066$, Table 5).

Discussion

The health care system in Taiwan places no restrictions on patient DSB,^{32,33} allowing free access to all institutions and specialists. Although previous research on DSB is limited, studies have identified a number of associated factors, with

Table 2 Characteristics of patients and whether or not conducting first-time doctor-shopping behavior

Variables	OR	95% CI	P-value
Age, years (ref = <50)			
>70	0.858	0.383 10.921	0.709
51–70	1.457	0.337 60.295	0.614
Gender (ref = female)			
Male	1.476	0.649 30.356	0.353
Education (ref = elementary/illiterate)			
Middle school	0.821	0.363 10.853	0.634
High school	1.219	0.487 30.053	0.673
Above college	1.039	0.358 30.010	0.945
Marriage (ref = married)			
Unmarried	0.690	0.272 10.754	0.436
Divorced/widowed	1.615	0.408 60.395	0.495
Hepatitis (ref = negative)			
B	2.532	1.040 60.164	0.041
C	1.919	0.711 50.183	0.127
B + C	2.405	0.416 130.887	0.372
Family history (ref = no history)			
HCC and/or hepatitis	1.829	0.692 40.836	0.224
Other cancers	0.949	0.279 30.235	0.934
Recurrence (ref = no)			
Yes	0.411	0.205 00.824	0.012
Progressive disease (ref = no)			
Yes	1.188	0.548 20.576	0.663
Upfront first treatment (ref = no)			
Yes	0.939	0.479 10.839	0.854

Note: Multivariate logistic model, $n = 357$.

Abbreviations: CI, confidence interval; HCC, hepatocellular carcinoma; OR, odds ratio.

Table 3 Characteristics of class 2 patients and extent of doctor-shopping behavior at outside hospitals

Variables	OR	95% CI	P-value	
Age, years				
(ref = <50)				
51–70	0.967	0.442	2.115	0.932
>70	0.502	0.125	2.018	0.331
Gender				
(ref = female)				
Male	0.441	0.186	1.042	0.062
Education				
(ref = elementary/illiterate)				
Middle school	0.614	0.249	1.514	0.290
High school	0.953	0.415	2.185	0.909
Above college	1.771	0.684	4.585	0.239
Marriage				
(ref = married)				
Unmarried	1.267	0.454	3.536	0.652
Divorced/widowed	0.304	0.073	1.274	0.103
Hepatitis				
(ref = negative)				
B	1.174	0.424	3.255	0.758
C	0.720	0.222	2.336	0.585
B + C	0.787	0.122	5.067	0.801
Family history				
(ref = no history)				
HCC and/or hepatitis	0.631	0.283	1.410	0.262
Other cancers	0.744	0.209	2.648	0.648
Recurrence				
(ref = no)				
Yes	1.033	0.518	2.063	0.926
Progressive disease				
(ref = no)				
Yes	1.427	0.660	3.087	0.366
Upfront first treatment				
(ref = no)				
Yes	0.435	0.206	0.918	0.029

Notes: Once versus more than once, multivariate logistic model, n = 278.

Abbreviations: CI, confidence interval; HCC, hepatocellular carcinoma; OR, odds ratio.

treatments and outcomes remaining the major concerns for patients. Therefore, disease recurrence or progression, and patients' failure to receive timely treatment, may be potentially associated with DSB. However, electronic medical records do not provide information on treatment planning discussions during the physician-patient encounter. Therefore, receiving treatment was a proxy indicator of patients' agreement with the recommended treatment and choice to stay with the provider. In addition to the usual reasons for seeking second opinions, as identified in an Australian study,³⁴ the present series also revealed distinct seeking of high-technology treatment options as a reason for DSB.

Unlike other malignancies, primary HCC usually requires multiple cycles of locoregional treatment. Disease progression

Table 4 Characteristics of class 2 patients* and extent of doctor-shopping behavior at outside hospitals

Variables	OR	95% CI	P-value	
Age, years				
(ref = <50)				
51–70	0.244	0.016	30.698	0.309
>70	<0.001	<0.001	>9990.999	0.939
Gender				
(ref = female)				
Male	0.026	0.002	0.422	0.010
Education				
(ref = elementary/illiterate)				
Middle school	0.013	<0.001	0.601	0.027
High school	0.138	0.009	10.999	0.146
Above college	0.111	0.004	20.956	0.190
Marriage				
(ref = married)				
Unmarried	0.093	0.002	30.842	0.211
Divorced/widowed	0.021	<0.001	10.694	0.085
Hepatitis				
(ref = negative)				
B	1.051	0.051	210.752	0.974
C	0.042	<0.001	40.022	0.173
B + C	158.927	0.527	>9990.999	0.082
Family history				
(ref = no history)				
HCC and/or hepatitis	0.174	0.012	20.543	0.201
Other cancers	3.431	0.230	510.089	0.371
Recurrence				
(ref = no)				
Yes	0.177	0.016	10.947	0.157
Progressive disease				
(ref = no)				
Yes	4.402	0.791	240.485	0.091
Upfront first treatment				
(ref = no)				
Yes	<0.001	<0.001	>9990.999	0.921
First salvage treatment				
(ref = no)				
Yes	0.966	0.042	220.383	0.983

Notes: *Progression and/or recurrence eligible for first salvage treatment. Once versus more than once, multivariate logistic model, n = 107.

Abbreviations: CI, confidence interval; HCC, hepatocellular carcinoma; OR, odds ratio.

represents a more severely worsening condition than recurrence. Recurrence and progression of HCC may cause loss of confidence in physicians and a strong tendency toward DSB. This reflects the fact that, irrespective of how unrealistic expectations may be, most patients accept any treatment, even if the chances of benefit are minimal.³⁵ Analyses in the present study did not identify any effects of progression on DSB. This may be due to the complex causes of death from liver cirrhosis, which may predate and negate the influence of progression. Contradictory to our hypothesis, recurrence was significantly less likely to be associated with first-time DSB.

Table 5 Characteristics of patients and whether they stay at or leave the study hospital

Variables	OR	95% CI	P-value
Age, years			
(ref = <50)			
51–70	0.850	0.456 1.583	0.609
>70	0.270	0.088 0.830	0.022
Gender			
(ref = female)			
Male	1.255	0.626 2.397	0.553
Education			
(ref = elementary/illiterate)			
Middle school	0.712	0.363 1.394	0.321
High school	0.846	0.432 1.656	0.625
Above college	1.862	0.846 4.098	0.122
Marriage			
(ref = married)			
Unmarried	1.045	0.477 2.290	0.912
Divorced/widowed	0.622	0.209 1.856	0.395
Hepatitis			
(ref = negative)			
B	1.407	0.639 3.097	0.397
C	2.173	0.895 5.278	0.086
B + C	1.428	0.360 5.655	0.612
Family history			
(ref = no history)			
HCC and/or hepatitis	0.842	0.438 1.617	0.606
Other cancers	1.187	0.455 3.096	0.726
Recurrence			
(ref = no)			
Yes	0.703	0.397 1.245	0.227
Progressive disease			
(ref = no)			
Yes	0.861	0.470 1.576	0.627
First in-house treatment			
(ref = no)			
Yes	0.593	0.339 1.036	0.066

Note: Multivariate logistic model, n = 357.

Abbreviations: CI, confidence interval; HCC, hepatocellular carcinoma; OR, odds ratio.

A possible explanation for this may be that patients had already done their DSB for surgical or diagnostic purposes prior to the occurrence and influence of true disease recurrence. In reality, not only differences in cultures and health care systems may influence causes of DSB, but research in different settings may also occasionally yield results contradictory to existing knowledge about DSB. Considering the series reported by Mellink et al as an example, negative experiences and dissatisfaction might not lead to motivation to seek second opinions.³⁶ Among hepatitis carriers, hepatitis B status was an independent factor significantly related to DSB. Patients showing first-time DSB were significantly more likely to be hepatitis B carriers than noncarriers. Possible reasons for this include high patient awareness of the endemic and an abundance of hepatitis B-related social campaigns in society.

The present study hypothesized that more upfront first treatments received by patients is indicative of a lower probability of first-time DSB. However, whole group analysis was unable to show this influence. In subgroup analysis, class 2 patients receiving more upfront first treatments were significantly less likely to show multiple DSB. This was especially true in a number of class 2 patients who sought expert opinions (first DSB) prior to making treatment decisions. Once they had decided to receive treatment, they were less likely to leave for another or multiple opinions. An explanation for why men were significantly less inclined to undertake multiple DSB than women has yet to be identified.

According to a survey often cited by physicians, requests for more treatments account for nearly half the reasons for patients seeking a second opinion.³⁷ Therefore, during examination of the effects of in-house treatment on decisions to leave or stay with the study hospital, receiving treatment was a proxy indicator of patient compliance, and reasonably inferred patients' decisions to stay. In multivariate analyses, none of the factors were significant, except for elderly patients (>70 years), who were more likely than younger patients to stay with rather than leave the study hospital.

In some Western series, older adults have been shown to be much more trusting of their physicians and less likely to seek second opinions.³⁸ If patients trust their physicians, satisfaction increases with age.³⁹ This implies DSB may occur less frequently, even without direct measurement, if trust exists. Therefore, trust may be a proxy for DSB. However, it is a construct of various definitions that distrust may lead to subsequent disenrollment, switching physicians or institutions, poor loyalty, and nonadherence.⁴⁰ Nevertheless, the role that trust plays in DSB is never simple to understand and measure, with so many theories and limited data available. Previous research has also yielded conflicting results concerning whether age has an impact on trust.⁴¹ More importantly, different cancer types have their own age predictions in incidence, in which age can have a significant or nonsignificant effect on DSB. The only way to delineate how age affects DSB is to use a larger study series focusing on how age influences commitment to a physician or institution and how trust develops and evolves.

Another explanation for the age factor may relate to patient infirmity, such that supportive care is always the preference of patients and/or physicians. In other words, poor physical performance may limit patient opportunities to seek other opinions. Other possible explanations for the lack of effects of other factors on DSB include the late stage of some heavily pretreated patients, and/or the occurrence

of acute life threatening events (such as esophageal varices bleeding, encephalopathy), which allow patients no other option than to stay for supportive care before succumbing to the disease. In light of all these results, we believe ours is the first study to correlate disease status and treatments with DSB, an intuitive association that has rarely been verified in previous studies.

DSB occasionally escapes notice until loss of the patient from regular follow-up. Any single model theory cannot explain the sporadic occurrence of DSB during a long dynamic process. Previous studies have investigated factors associated with DSB in patients at initial diagnosis or in the early phase of treatment. For cancer, the entire treatment course can be complicated by patient disease status, psychological reactions, and family attitudes. The patients are also in a constant state of change because of experiences with treatment and interactions with health professionals other than oncologists. Patients and their families usually monitor outcomes and may question the physician's competence.⁴² Therefore, the relationship between patient and physician is neither stable nor indefinite, rationalizing DSB when patients feel insecure or are uncomfortable with the results of treatment. In an analysis of the characteristics of patients with DSB, Tattersall et al observed that those presenting to cancer outpatient clinics were generally more highly educated breast cancer patients working in managerial or professional positions.³⁴ However, the characteristics of patients investigated in their study do not apply to the HCC patients in our present study. This reflects not only the uniqueness of patients, but also the fact that different study designs may have varying interpretations.

Increasing patient expectations from health care and increased accessibility to SO may result in increasing numbers of patients seeking these.^{3,43} This is especially true in the era of the Internet, at a minimal rate of 10%–44%,^{44,45} and in any health care system without a “gatekeeper”. In oncology, single or multiple DSB are likely to occur frequently because of the life threatening nature of a disease and the toxic treatment modalities often used. Regardless, investigators have suggested that physicians can and should take measures to prevent a proportion of second opinions, or at least some of the patients' unrealistic expectations.^{30,46} A nationwide hepatitis surveillance program initiated by the Bureau of National Health Insurance in 2011 is designed to follow up carriers to balance the advantages and disadvantages of DSB. This program promotes periodic surveillance and continuity of care in the hope of early detection and intervention. To reduce the costs incurred by patient DSB, this program also rewards physician-initiated referral. This can consolidate

the patient-physician relationship by enhancing the level of trust between both parties, and can also facilitate effective communication of a treatment plan after a diagnosis of HCC. Even for patients who wish to be referred to another physician, this patient-centered approach will help physicians to respect patient preferences rather than act in an authoritarian manner.

However, people generally hold the fundamental belief that they have the right to knowledge, information, and control over management decisions. Based on this argument, it is the patient's right to seek an SO if this empowers them to make appropriate decisions. This holds true in the era of consumerism, patient autonomy, empowerment, and the Internet. Generally, as suggested by Barsky,⁴⁷ seeking SO is a social phenomenon and DSB is for reimbursement purposes (Second Surgical Opinion Programs, US),⁴⁸ and all other possible ethical and legal issues^{49,50} may ensue. Sato et al suggested that SO once is more of an acceptable behavior than DSB more than once, which may give an impression of abusing medical resources.²⁷

DSB may occasionally imply a negative experience for both patients and providers, and may be perceived as distrust or dissatisfaction with the services provided. However, the patient's health remains his/her (and the oncologist's) primary consideration. As described by Axon et al, numerous differing viewpoints exist in medicine; no one is infallible, and professional arrogance has no part to play.⁵¹ Appropriate perspectives on the part of the institution and its physicians toward SO and DSB may include respect for the patient's preferences, attitudes, and decisions for DSB; DSB provides the opportunity to re-evaluate the treatment offered, which may not be of the highest standard, to maximize its benefits and avoid legal issues, and to involve the patient and caretakers in a shared decision-making process throughout the course of the disease.

In conclusion, the findings of the present study indicate that recurrence is less likely to be associated with first-time DSB, and that hepatitis B carriers are more likely to show first-time DSB than noncarriers. Self-referred patients who received upfront first treatment were less likely to undertake multiple DSB than those who did not. This was especially true for male patients. Patients who did not accept upfront treatment tended to seek multiple opinions throughout the entire treatment course. Receiving first salvage treatment had no effect on the number of DSBs in self-referred patients.

This study has a number of limitations, including: limited external validity and under-representation based on a single institutional experience; the cutoff date of the last follow-up

may have missed some DSB information from the entire patient course; the sample size for analysis was not large enough to accommodate other variables that may contribute to DSB, such as chronic illness, comorbidities, psychosomatic problems, geographic convenience, and high-technology treatments; and lack of real information on physician-patient encounters and the decision-making process. Numerous studies have demonstrated that patient-physician communication has a significant influence on patient health outcomes.^{51–54} However, many social and cultural backgrounds relevant to this relationship differ between countries.⁵⁵ In the case of life threatening cancer, communication may have a strong impact on patient outcome.^{56,57} Uncertainty and anxiety on the part of the patient and their family may place greater demands on the relationship.^{58,59} Under these circumstances, the content of communication may act as a mediating factor leading to DSB. Further investigation of such factors and their association with DSB is warranted.

Conclusion

The present study is a person-based longitudinal retrospective analysis using ambulatory and inpatient electronic medical records for patients with HCC. The results demonstrate that DSB can occur during the entire course of treatment, even in patients with severe conditions. This is the first research to evaluate the effects of treatment at different time points, and the subsequent influence on patient DSB. The study also identifies factors contributing to multiple DSB in HCC patients. In 2008, the Bureau of Health Promotion launched a nationwide cancer center accreditation program, which might foster improvement in cancer management and quality of care. Further study is required to understand any changes in DSB following implementation of this program.

Disclosure

The authors report no conflicts of interest in this work.

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