Disclosures

None.

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SUPPLEMENTAL MATERIAL

Supplemental Table I. Characteristics of the three cities

	Akita	Kure	Shizuoka
Population size[*]	330,901	252,325	700,477
Population size: 40-74 years[*]	154,120	118,097	330,971
Proportion of people aged 40-74, %[*]	46.6	46.8	47.2
Proportion of people aged $\geq$ 65, %[*]	22.4	26.0	21.9
Area size, km^2	905.7	353.9	1411.9
Distance, km			
Akita-Kure		903.2	
Akita-Shizuoka		548.6	
Kure-Shizuoka		538.0	

[*]Data of 2006

Original Paper

Cerebrovascular Diseases

Public Awareness of Early Symptoms of Stroke and Information Sources about Stroke among the General Japanese Population: The Acquisition of Stroke Knowledge Study

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Abstract
Background: It is important that the general population be aware of the early symptoms, since it has been shown that early arrival to hospitals leads better prognosis of stroke patients. However, the general population is not well informed about the early symptoms of stroke. This study was conducted to clarify which stroke symptoms are less well known and which information sources are related to awareness of stroke symptoms. *Methods:* A multiple-choice, mail-in survey involving 5,540 randomly selected residents, aged 40–74 years, of 3 cities in Japan was conducted. Their knowledge about stroke symptoms and their information sources were surveyed; information sources were classified as mass media (television/newspaper/radio) and personal communication sources (posters/leaflets/internet/health professionals/family and/or friends). 'Awareness' was defined as selecting all 5 of the correct stroke symptoms from among 10 listed symptoms with decoy choices. The estimated fraction of the possible impact due to each source on the whole population was also calculated by odds ratios (ORs) and the proportion of respondents who selected each source (Pe). The combined effects of mass media and personal communication sources on awareness were also assessed. *Results:* Of the 5,540 residents, only 23% selected all 5 correct symptoms. Visual disturbance was the least known of the 5 symptoms (35%). All sources were positively related to awareness, with ORs (Pe) of: television, 1.58 (72.5%); newspaper, 1.79 (48.0%); radio, 1.74 (13.3%); posters, 1.73 (7.6%); leaflets, 1.50 (24.7%); Internet, 1.66 (5.6%); health professionals, 1.33 (34.8%), and family/friends, 1.21 (44.6%). The estimated fraction of the possible impact due to each source was higher for mass media (television, 0.31 and newspaper, 0.28) than personal communication sources (Internet, 0.04 and leaflets, 0.12). Mass me-

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dia only and mass media/personal communication sources were significantly associated (ORs: 1.66, 2.75, respectively). **Conclusions:** As a single method of public education, television could be the most effective strategy. Moreover, the combined approach involving mass media and personal communication sources might have a synergistic effect. Less well-known symptoms, such as visual disturbances, should be noted in public education campaigns.

Introduction

Stroke is the leading cause of permanent disability in adults and one of the major leading causes of death and disability worldwide [1–5]. Some previous studies examining time limit for initiation of intravenous thrombolysis therapy using alteplase demonstrated that alteplase treatment within 4.5 h of onset improved functional outcome [6, 7]. However, it was also reported that delay in hospital presentation of patients with acute stroke still remained substantial [8–11]. The reasons for this delay were attributed to both lack of awareness of stroke attacks and nonuse of ambulances in previous studies [8, 12]. Thus, it is important for improving stroke outcomes to educate citizens to react immediately and appropriately at their stroke onset. Such community education should be focused on the recognition of early symptoms of stroke onset and appropriate reaction at stroke onset, i.e., to call an ambulance as soon as possible. Despite the importance of recognizing early symptoms, the population remains poorly informed about the early symptoms of stroke [13–17].

The purpose of the present study was to clarify which early symptoms of stroke are less well known, and which information sources are used to obtain knowledge about stroke by the general Japanese population. The study aimed furthermore to identify which information sources were related to awareness of stroke symptoms.

Methods

Acquisition of Stroke Knowledge (ASK) Study

This study was conducted as a baseline survey of a nonrandomized community intervention trial, the Acquisition of Stroke Knowledge Study, to improve awareness about early symptoms of stroke and the appropriate response to stroke onset. Three cities in Japan, i.e., Akita, Shizuoka and Kure, were selected. Akita is located in the northern part of Japan. In the present study, two districts of Akita city, i.e., Kawabe and Yuwa, were selected in order to prepare for future intensive intervention targeting im-

provement of knowledge about stroke. Kure is a city in Hiroshima prefecture in the western part of Japan, and Shizuoka is located in the central part of Japan. A preintervention survey was followed by community intervention. After the community intervention, postintervention surveys have been performed to assess a long-term effect of our intervention, which are now ongoing and under analysis. This article was based on the preintervention survey in 2006.

From these three areas, 11,306 community dwellers, aged 40–74 years, were randomly selected by an age-stratified random sampling method from the Basic Resident Register. To align the age distribution among participants in the three areas, the number of listed participants in each age bracket, i.e., 40–49, 50–59, 60–69 and 70–74, was almost equal.

Measures and Procedure

A mail-in survey was conducted from April to July in 2006, and a closed-end questionnaire was mailed to each participant. The questionnaire consisted of the following: general knowledge of stroke, early symptoms of stroke, what to do at the time of stroke onset, information sources for knowledge about stroke, and sociodemographic factors (see 'Appendix'). The questions regarding 'early symptoms of stroke' consisted of 5 correct answers and 5 decoy answers as multiple-choice items. The questions regarding 'information sources about stroke' consisted of 11 multiple-choice items. For these questions, multiple answers were allowed. The questions regarding 'Response to stroke attack' consisted of 7 multiple-choice items, for which a single answer was required.

This study was approved by the ethics committee of Shiga University of Medical Science (17–97).

Analysis Methods

Differences in responses among age groups were assessed with the χ^2 test. In this study, respondents with 'awareness' of early symptoms were defined as those who selected all 5 correct early symptoms of stroke from the 10 symptoms listed, except for those who selected all items. The odds ratio (OR) of having 'awareness' of early symptoms from an information source was calculated with logistic regression analysis after adjusting for age, sex, survey site, with/without risk factors for stroke, with/without stroke patients close to respondents, and living alone or not, among respondents who did not have a past history of stroke. In addition, the estimated fraction of possible impact due to each information source on the whole population was calculated according to the ORs mentioned above and the proportion of respondents who chose each information source using this formula in analogy to Levin's [18] formula for population-attributable risk: [Pe × (multivariate adjusted OR -- 1)]/[Pe × (multivariate adjusted OR -- 1) + 1], where Pe is the proportion of respondents who chose one information source as their own information source, and OR is the odds ratio of having awareness of early symptoms in the same respondents. We believe that both of them are important to improve public awareness. Further logistic regression analysis was performed to assess the combined effect of mass media and personal communications on awareness of stroke symptoms.

All significance tests were two-tailed, and $p < 0.05$ was considered significant in all analyses. Data were analyzed with SPSS version 15.0 for Windows (SPSS Inc.).

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Table 1. Response rate and characteristics of respondents by sex and age

	Overall	Sex		Age, years			
		men	women	40–49	50–59	60–69	70–74
Responses, n	5,540	2,618	2,922	1,390	1,524	1,779	847
Subjects, n	11,306	5,672	5,634	3,184	3,311	3,207	1,604
Response rate, %	49.0	46.2	51.9	43.7	46.0	55.5	52.8
	(n = 5,540)	(n = 2,618)	(n = 2,922)	(n = 1,390)	(n = 1,524)	(n = 1,779)	(n = 847)
Past history of stroke	128 (2.3)	81 (3.1)	47 (1.6)	7 (0.5)	14 (0.9)	60 (3.4)	47 (5.5)
Self-reported underlying diseases of stroke							
High blood pressure	1,211 (21.9)	656 (25.1)	555 (19.0)	107 (7.7)	270 (17.7)	518 (29.1)	316 (37.3)
High cholesterol	729 (13.2)	325 (12.4)	404 (13.8)	94 (6.8)	217 (14.2)	306 (17.2)	112 (13.2)
Diabetes	429 (7.7)	270 (10.3)	159 (5.4)	43 (3.1)	85 (5.6)	193 (10.8)	108 (12.8)
Heart diseases	213 (3.8)	127 (4.9)	86 (2.9)	10 (0.7)	26 (1.7)	103 (5.8)	74 (8.7)
Arrhythmia	423 (7.6)	241 (9.2)	182 (6.2)	50 (3.6)	102 (6.7)	172 (9.7)	99 (11.7)
Transient ischemic attack	31 (0.6)	19 (0.7)	12 (0.4)	1 (0.1)	4 (0.3)	11 (0.6)	15 (1.8)
At least one of diseases mentioned above	2,143 (38.7)	1,131 (43.2)	1,012 (34.6)	253 (18.2)	521 (34.2)	888 (49.9)	481 (56.8)
With stroke patients close to respondents	3,031 (54.7)	1,426 (54.5)	1,605 (54.9)	703 (50.6)	883 (57.9)	1,010 (56.8)	435 (51.4)
Living alone	471 (8.5)	230 (8.8)	241 (8.2)	92 (6.6)	115 (7.5)	166 (9.3)	98 (11.6)

Data shown as number of subjects with percentage in parentheses.

Results

Response Rate and Age Distribution of the Survey Population

The respondents of this study were 5,540 individuals (response rate 49.0%) with a mean age of 58.1 ± 9.8 years, 52.7% were women (table 1). Of the respondents, 2.3% reported a history of stroke, 54.7% reported that a close acquaintance had suffered a stroke, and 38.7% had at least one of the risk factors for stroke (table 1).

Knowledge of Stroke

As shown in table 2, approximately 80% of all respondents reported knowing what stroke was. Concerning early symptoms of stroke, approximately 90% of respondents appropriately selected 'sudden hemiplegia' and 'sudden speech problem' as early symptoms, followed by 'sudden, severe headache' (72.3%) and 'sudden dizziness or loss of balance' (62.7%). However, only 35.0% of respondents selected 'sudden vision problem'. Of all respondents, 1,288 (23.2%) were classified as having 'awareness' of early symptoms, which was defined as complete selection of the 5 correct early symptoms. The proportion of respondents who had 'awareness' was higher in those aged less than 60 years (26.8, 19.3%, respectively, p < 0.001 for the χ^2 test), and was higher in those who had someone close who was a stroke patient than those who did not

(26.1, 19.8%, respectively, p < 0.001 for the χ^2 test). Even among 4,285 respondents who reported that 'I generally know what a stroke is', only 1,076 (25.1%) were defined as those who had awareness of early symptoms of stroke (data not shown). Over 80% of respondents answered that they would call an ambulance at stroke onset (table 2).

Associations between Information Sources and Awareness of Early Symptoms of Stroke

In the present study, eight information sources were grouped into two major types of information sources. Television, newspaper, and radio were categorized as 'mass media', and Internet, family/friends, leaflets, posters, and health professionals were categorized as 'personal communication sources'. As shown in table 3, the proportion of respondents who chose television (72.4%) was higher than other information sources, especially 'personal communication sources'. Few respondents selected the Internet and posters as the information source about stroke. Substantial gender difference was not observed. Health professionals were chosen by elders, whereas Internet was chosen by young people.

The results of multivariate-adjusted logistic regression analyses, which were performed to assess associations between each information source and 'awareness' of early symptoms, are shown in table 4. These results demonstrated that respondents who obtained information for

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Table 2. General knowledge, knowledge of risk factors and early symptoms of stroke, and reaction to stroke onset by sex and age

	Overall (n = 5,540)	Age, years				p value
		40–49 (n = 1,390)	50–59 (n = 1,524)	60–69 (n = 1,779)	70–74 (n = 847)	
Do you know what is 'stroke'?[a]						<0.001
Generally know	4,285 (77.3)	1,017 (73.2)	1,194 (78.3)	1,401 (78.8)	673 (79.5)	
Only name of disease	1,063 (19.2)	339 (24.4)	284 (18.6)	310 (17.4)	130 (15.3)	
Do not know	96 (1.7)	9 (0.6)	21 (1.4)	40 (2.2)	26 (3.1)	
Nonresponding	96 (1.7)	25 (1.8)	25 (1.6)	28 (1.6)	18 (2.1)	
What are the early symptoms of stroke onset?[b]						
Sudden one-sided numbness or weakness of the face, arm, or leg	4,797 (86.6)	1,242 (89.4)	1,346 (88.3)	1,512 (85.0)	697 (82.3)	<0.001
Sudden confusion or trouble speaking or understanding others	4,796 (86.6)	1,255 (90.3)	1,371 (90.0)	1,495 (84.0)	675 (79.7)	<0.001
Sudden severe headache with no known cause	4,008 (72.3)	1,077 (77.5)	1,158 (76.0)	1,222 (68.7)	551 (65.1)	<0.001
Sudden dizziness, trouble walking, or loss of balance or coordination	3,471 (62.7)	882 (63.5)	997 (65.4)	1,111 (62.5)	481 (56.8)	<0.001
Sudden trouble seeing in one or both eyes	1,938 (35.0)	571 (41.1)	579 (38.0)	544 (30.6)	244 (28.8)	<0.001
Palsy of both hands and/or fingers[c]	2,461 (44.4)	675 (48.6)	712 (46.7)	729 (41.0)	345 (40.7)	<0.001
Selected all 5 correct warning signs of stroke	1,288 (23.2)	373 (26.8)	408 (26.8)	344 (19.3)	163 (19.2)	<0.001
Selected all 5 correct warning signs of stroke[d]	1,267 (23.0)	367 (26.4)	399 (26.2)	339 (19.1)	162 (19.1)	<0.001
How do you respond if you are having a stroke attack?[a]						<0.001
Immediately call an ambulance	4,500 (81.2)	1,176 (84.6)	1,265 (83.0)	1,401 (78.8)	658 (77.7)	
Immediately call a primary physician at clinic or hospital	401 (7.2)	44 (3.2)	89 (5.8)	171 (9.6)	97 (11.5)	
Immediately call a large and/or special hospital	150 (2.7)	40 (2.9)	38 (2.5)	48 (2.7)	24 (2.8)	
Immediately see a primary physician at clinic or hospital	124 (2.2)	24 (1.7)	29 (1.9)	54 (3.0)	17 (2.0)	
Immediately see a doctor in large and/or special hospital	261 (4.7)	78 (5.6)	82 (5.4)	72 (4.0)	29 (3.4)	
See a primary physician at clinic or hospital during office hours	24 (0.4)	6 (0.4)	2 (0.1)	9 (0.5)	7 (0.8)	
See a doctor in large and/or special hospital during office hours	11 (0.2)	4 (0.3)	2 (0.1)	3 (0.2)	2 (0.2)	
Wait and observe symptoms for several days	11 (0.2)	3 (0.2)	3 (0.2)	4 (0.2)	1 (0.1)	
Unknown	58 (1.0)	15 (1.1)	14 (0.9)	17 (1.0)	12 (1.4)	

Data shown as number of subjects with percentage in parentheses. [a] Single answer was required. [b] Multiple answers allowed. [c] Decoy answer. [d] Of the 5,519 respondents, excluding those who chose all 10 items. p value for χ^2 test.

Table 3. Proportion of respondents who chose each information source among 5,391 members[a] of the general population (%, by sex and age)

Type of information source	Overall (n = 5,391)	Sex		Age, years			
		men (n = 2,527)	women (n = 2,864)	40–49 (n = 1,377)	50–59 (n = 1,501)	60–69 (n = 1,714)	70–74 (n = 799)
Mass media							
Television	72.4	68.5	75.9	74.2	71.8	73.2	69.0
Newspaper	48.0	48.1	47.8	48.0	50.2	49.5	40.3
Radio	13.2	14.4	12.1	11.1	14.9	14.3	11.1
Personal information							
Internet	5.5	7.1	4.1	10.7	6.9	2.1	1.3
Family/friends	44.5	40.5	48.0	39.7	48.7	47.0	39.5
Leaflets	24.6	25.6	23.7	20.0	29.2	25.9	20.9
Posters	7.5	8.2	6.9	7.8	9.3	7.0	4.6
Health professionals[b]	34.7	36.6	33.0	21.9	30.5	41.4	50.2

[a] 5,391 respondents excluding respondents who had a past history of stroke (n = 128) or selected all 10 as early symptoms (n = 21). [b] Medical doctors and/or nurses.

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Fig. 1. Estimated fraction of possible impact of each information source on awareness about stroke symptoms on the whole population (for formula, see text). ORs were calculated adjusting for age, sex, survey site, with/without close stroke patients, living alone or not, with/without risk factors of stroke such as high blood pressure, high cholesterol, diabetes, heart disease, arrhythmia, and transient ischemic attack, along with each information source. Rhombus markers and whiskers indicate ORs and 95% CIs. Gray bars show the proportion of respondents who chose each information source. TV = Television; NP = newspaper; Ra = radio; Le = leaflet; HP = health professionals; F/f = family/friends; Po = poster; In = internet.
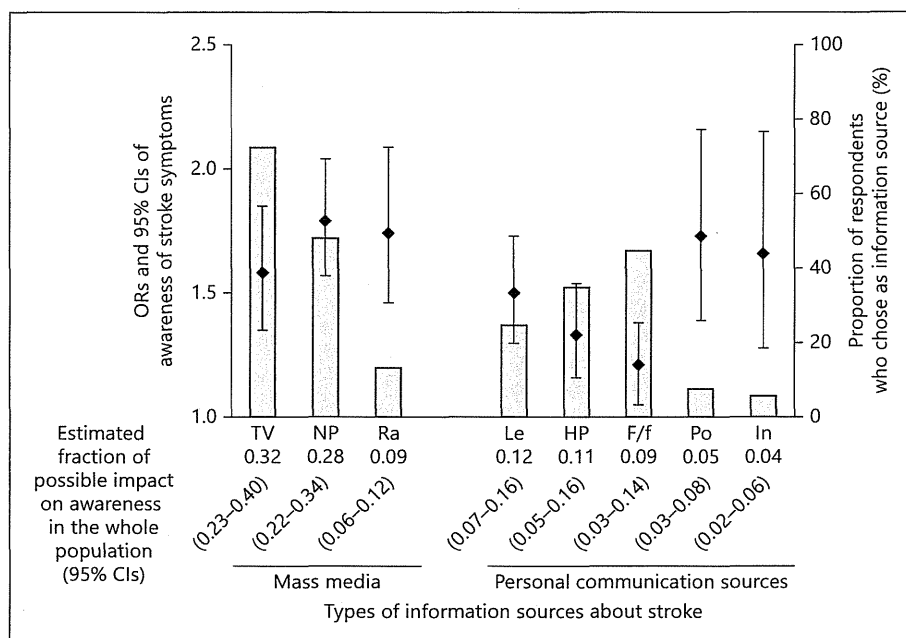
Table 4. Awareness of stroke symptoms by each information source among 5,391 members of the general population

Type of information source	Univariate		Multivariate adjusted[b]	
	ORs	95% CIs	ORs	95% CIs
Mass media				
Television	1.68	1.44–1.96	1.65	1.41–1.93
Newspaper	1.83	1.61–2.08	1.81	1.59–2.06
Radio	1.67	1.41–1.98	1.75	1.47–2.08
Personal information				
Internet	1.94	1.51–2.48	1.68	1.30–2.16
Family/friends	1.27	1.12–1.44	1.21	1.06–1.38
Leaflets	1.53	1.33–1.76	1.53	1.32–1.76
Posters	1.78	1.44–2.22	1.74	1.40–2.17
Health professionals[a]	1.23	1.08–1.40	1.34	1.16–1.54

'Awareness of stroke symptoms' was defined as to select all of 5 correct early symptoms of stroke (n = 1,241, 23.3%). ORs and 95% CIs were calculated among 5,391 respondents, excluding respondents who had a past history of stroke (n = 128) or selected all 10 as early symptoms (n = 21).

[a] Medical doctors and/or nurses.

[b] Multivariate-adjusted ORs and 95% CIs were calculated adjusting for age, sex, survey site, with/without closed person with stroke, living alone, with/without risk factors of stroke such as high blood pressure, high cholesterol, diabetes, heart disease, arrhythmia, and transient ischemic attack for each information source.

stroke from any type of sources were more likely to be aware of early symptoms of stroke than their counterparts: newspaper (OR: 1.81), radio (OR: 1.75), and television (OR: 1.65) as 'mass media', and posters (OR: 1.74), Internet (OR: 1.68), leaflets (OR: 1.53), health professionals (OR: 1.34), and family/friends (OR: 1.21) as 'personal communication sources'.

Estimated Fraction of Impact due to Each Information Source on the Whole Population

Figure 1 shows the estimated fraction of the impact due to each information source about awareness of stroke symptoms on the whole population. Mass media, especially television and newspapers, were found to have a large estimated fraction, i.e., 0.32 (95% confidence interval, CI, 0.23–0.40) for television and 0.28 (95% CI, 0.22–0.34) for newspaper. On the other hand, despite high ORs, posters and the Internet as personal communication sources had a relatively small estimated fraction due to the small proportion of respondents who chose them as information sources, 0.05 (95% CI, 0.03–0.08) for posters and 0.04 (95% CI, 0.02–0.06) for the Internet.

Combination of Mass Media and Personal Communications

To assess the combined effect of mass media and personal communications on 'awareness' of early symptoms, respondents were divided into four groups according to the

Fig. 2. ORs and 95% CIs of awareness of stroke symptoms by types of communication source among 5,391 participants of the general population. 'Awareness of stroke symptoms' was defined as selecting all 5 correct early symptoms of stroke. ORs and 95% CIs were calculated among the 5,391 respondents, except for respondents who had a past history of stroke (n = 128) or selected all 10 as early symptoms (n = 21). ORs were calculated adjusting for age, sex, survey site, with/without close stroke patients, living alone or not, with/without risk factors of stroke such as high blood pressure, high cholesterol, diabetes, heart disease, arrhythmia, and transient ischemic attack, along with each information source.
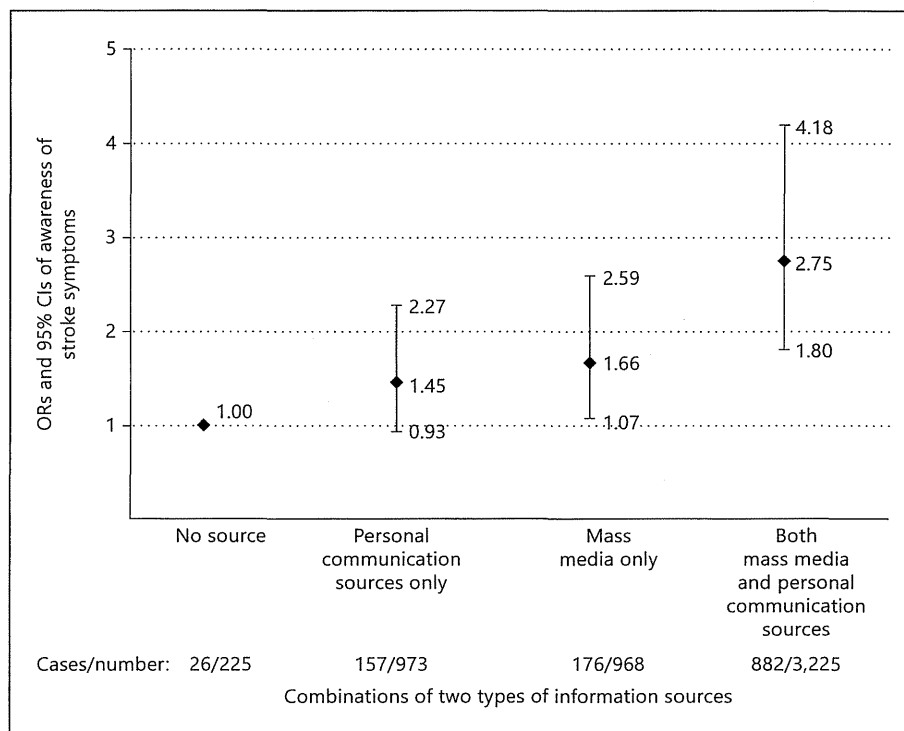
type of information source (no source, personal communication sources only, mass media only, both mass media and personal communication sources). On multivariate-adjusted logistic regression analysis using 'no information source' as the reference group, as shown in figure 2, obtaining knowledge about stroke from 'mass media only' was positively related to 'awareness' of early symptoms of stroke (OR: 1.66). The combination of mass media and personal communication sources was significantly related to better knowledge of early symptoms of stroke (OR: 2.75). 'Personal communication sources only' did not have a significant association with awareness of stroke symptoms.

Discussion

The present study is the first community-based study focusing on information sources for 'awareness' of early symptoms of stroke among the general population in Japan. In the present study, the proportion of the general population reported that they would call an ambulance if attacked by a stroke was higher than in the United States [19]. However, only about one fourth of respondents (23.2%) selected all of the correct early symptoms of stroke. Furthermore, despite the low prevalence of respondents

who selected all 5 correct answers, nearly 80% of respondents reported that 'I generally know what stroke is'.

In previous studies that focused on knowledge about stroke, 35–70% of respondents had awareness of the early symptoms of stroke [20–22]. The discrepancy in the proportion of people with awareness between previous studies and the present study may be due to the difference in the definitions of 'to be aware' of stroke symptoms. In the present study, persons with awareness were defined as those who selected all 5 correct early symptoms of stroke from among 10 symptoms. On the other hand, knowledge of only 1–2 of correct symptoms was defined as awareness in the analysis of previous studies, i.e. Fogle et al. [22] defined a person reporting two or more symptoms of stroke as one who had awareness of stroke symptoms, and they reported that the proportion of people with awareness was 68–73% before the campaign. The reason why such a strict definition was used for the assessment of awareness about stroke symptoms in the present study is that people cannot choose their stroke symptom when it occurs. Robinson et al. [23] reported that symptoms not included in the FAST campaign (leg weakness and visual loss) were poorly recognized by British people and indicated that this lack of knowledge might lead to delays in hospital presentation. Actually, in the Greater

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Cincinnati/Northern Kentucky Stroke Study, it was found that stroke/transient ischemic attack patients with numbness or visual changes were less likely to contact emergency medical services [24]. To call an ambulance and go as an emergency to the hospital, people who have stroke attacks and bystanders must recognize that it is a stroke, no matter which early symptom is observed. As to knowledge of which early symptom is lacking, less severe symptoms such as 'sudden vision problem' and 'sudden dizziness or loss of balance' tended to be recognized less as early symptoms than sudden hemiparesis/speech problem/severe headache in the present study, which should be emphasized in public education or a campaign.

This study also clarified how general citizens obtained knowledge about stroke, for example, from mass media, such as television, newspaper, and radio, or personal communication sources, such as the Internet, family/friends, leaflets, posters, and health professionals. Apparently, all information sources were positively associated with higher awareness; the OR for having awareness was highest in the persons who selected newspapers as information source. However, in the present study, the estimated fraction of impact due to each information source on the whole population was the largest for television, followed by newspapers. Silver et al. [20] performed a telephone survey before and after mass media campaigns, and they reported that television advertisements changed the ability to name the early symptoms of stroke in a Western population. We also reported that a 1-year intervention with a television campaign improved public awareness of stroke symptoms only in the intervention area in a comparative study design [25]. It seems that consensus has been obtained about the strong effect of television on improvement of stroke knowledge in community-based interventions. However, Silver et al. [20] also reported in the previously cited study that no significant change by receiving print (newspaper) advertising was observed in their study. On the other hand, the present study demonstrated that respondents who reported newspapers as their information source tended to be aware about the early symptoms of stroke, and the estimated impact of newspapers on awareness of stroke symptoms was the second largest after television. A possible reason for explaining this discrepancy is the difference in the daily newspaper subscription rate between study populations. Since about 49,063,000 households in Japan in 2006 paid for a total of 69,100,000 subscriptions [26], it was considered that most Japanese read newspapers. Campaigns involving newspapers could be a particularly effective intervention strategy for populations with a high newspaper subscription rate.

To assess a certain information source, its effect on personal education and the proportion of citizens who chose it as their information source are both important in the view of public education. Accordingly, we calculated the estimated fraction of impact due to each information source on the whole population. The present study indicated that mass media might have a huge advantage in educational campaigns to improve knowledge about stroke. Our findings also suggest that personal communication sources, including leaflets and the Internet, show a potential effect to increase individual knowledge; however, it is important to improve their distribution systems to ensure that many citizens can access the above-mentioned personal communication sources. Additionally, in the present study, it is very interesting that acquisition of knowledge via a combination of mass media, such as television and newspaper, and personal communication sources, such as leaflets and/or posters, was strongly related to awareness of early symptoms of stroke. Our findings are valuable for the development of an efficient strategy for education of the public at large.

There are several limitations to the present study. Firstly, there might have been a response bias in the survey because of the low response rate. Unfortunately, information to compare responders and nonresponders could not be obtained. Respondents may have been citizens who were relatively interested in stroke. Thus, the prevalence of citizens who have awareness of stroke symptoms might be overestimated. Secondly, the intensity of exposure, such as the duration of watching television or reading a newspaper daily concerning stroke, was not evaluated because of the limited space of the mail-in survey questionnaire. Thirdly, socioeconomic factors, such as educational level or annual income, which might be associated with information sources [27], were not considered. However, representatives of local characteristics such as household composition ratio, educational levels and unemployment rate, did not substantially differ between average of three study areas and the whole of Japan. Finally, the cross-sectional design cannot prove causality. In conclusion, this community-based survey involving a randomly selected sample of the general population showed that most respondents knew that they should immediately seek healthcare, including use of an ambulance, when they suspected or are suspected to have a stroke attack. However, they did not completely understand the early symptoms of stroke onset, especially mild symptoms. Less well-known symptoms, such as visual problems, should be noted in the campaign. In addition, the present study showed that any type of information,

especially a combination of mass media such as television and newspapers and personal communication sources such as the Internet and leaflets, was associated with awareness of stroke symptoms. A campaign including a mixture of mass media and personal communications, therefore, should be an effective strategy for public education about stroke. Further prospective or intervention studies are needed to assess the synergistic effects of complex intervention strategies.

Disclosure Statement

None declared.

Appendix

Q1   Age _____ years
Q2   Sex
    1 Man
    2 Woman
Q3   Do you have any paid work/job now? (A part-time job is also included.)
    1 Yes
    2 No
Q4   Do you live alone?
    1 Yes
    2 No
Q5   Do you know what is stroke?
    1 Yes: generally know
    2 Yes: only name of the disease
    3 No
Q6   Do you know that stroke is comprised of three types, i.e., cerebral hemorrhage, cerebral infarction, and subarachnoid hemorrhage?
    1 Yes
    2 No
Q7   Have you suffered any disease? Please check all of the following
    1 No disease
    2 Cancer
    3 Heart disease
    4 Arrhythmia
    5 Stroke
    6 Transient ischemic attack
    7 Hypertension
    8 Gastroduodenal ulcer
    9 Liver disease
    10 Diabetes mellitus
    11 Hyperlipidemia/hypercholesterolemia
    12 Kidney disease
    13 Hyperuricemia/gout
    14 Rheumatoid arthritis
    15 Asthma
    16 Cataract
    17 Mental disorder
    18 Dementia
    19 Other disease
Q8   Do you have any family members, colleagues, or friends with a history of stroke?
    1 Yes
    2 No
Q9   What are the early symptoms of a stroke attack? Please choose all fitting symptoms from the following
    1 Sudden one-sided numbness or weakness of the face, arm, or leg
    2 Sudden nasal bleeding
    3 Sudden fever
    4 Sudden confusion or trouble speaking or understanding others
    5 Sudden pain on left shoulder
    6 Sudden trouble seeing in one or both eyes
    7 Sudden dizziness, trouble walking, or loss of balance or coordination
    8 Numbness of both hands and/or fingers
    9 Sudden severe headache with no known cause
    10 Sudden difficulty in breathing
Q10   How do you respond to a stroke attack? Please choose only one from the following
    1 Immediately call an ambulance
    2 Immediately call a family physician at clinic or hospital
    3 Immediately call a large and/or specialized hospital
    4 Immediately see a family physician at clinic or hospital
    5 Immediately see a doctor in large and/or specialized hospital
    6 See a family physician at clinic or hospital during office hours
    7 See a doctor in large and/or specialized hospital during office hours
    8 Wait and observe the symptoms for several days
Q11   What are your information sources of knowledge about stroke? Please choose all the sources
    1 Medical doctor
    2 Nurse and/or public health nurse
    3 Leaflet
    4 Poster
    5 Television
    6 Radio
    7 Newspaper
    8 Internet
    9 Family and/or friend
    10 Other (_____)
    11 No information source

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マスメディアによる脳卒中キャンペーンの効果

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抄録

　脳卒中発症時の適切な早期受診のためには、一般市民が症状と対処を理解している必要がある。過去の調査から、一般集団に対する啓発活動の手法として最も強い影響力を持つものは新聞やテレビなどのマスメディア、およびマスメディアとチラシなどの複合的取り組みであると考えられた[1]。そのため、脳卒中の予防・症状・治療等を取り上げたマスメディアによる啓発活動を1年間通して行うことにより、一般市民の脳卒中に関する知識がどの程度向上するか検証することを目的とした介入研究を実施した[2]。

　2009年4月〜2010年3月に実施されたNHK岡山放送局による「脳卒中防止キャンペーン」の前後それぞれで電話帳から無作為抽出を行い、介入地域（岡山市）と対照地域（呉市）に居住する40-74歳の者3,920名（各時期、各地域980名）に対して脳卒中発作時症状についての電話調査を実施した。脳卒中発作時症状は正答5症状とダミー5症状からなる10症状から正しいと思うものをすべて選択するよう求めた。また、介入地域の介入後評価では、「脳卒中防止キャンペーン」の視聴の有無を尋ねた。介入前調査での5症状正答割合は、介入地域53%（95%信頼区間：50-56%）、対照地域46%（95%信頼区間：43-49%）であった。1年間の介入後、介入地域のみ5症状正答者が有意に増加した（介入地域：63%，60-66%、対照地域：51%，48-54%）。男女別の検討では、介入地域の女性のみ介入後に5症状の正答者割合が有意に増加した。マスメディアによる1年間の啓発活動は一般市民、特に女性において、脳卒中発作時症状の認識に効果的であることが示された。

キーワード：　脳卒中、マスメディア、キャンペーン、テレビCM、介入研究

1. はじめに

　組織プラスミノーゲンアクティベーターによる経静脈的血栓溶解療法（t-PA療法）が脳梗塞後遺症を軽減することが明らかにされ、平成17年10月、本邦においてもt-PA療法が保険認可された。このt-PAの使用には出血の危険性から時間制限が設けられているため、発症早期の受診が極めて重要になった。脳卒中発症時の適切な早期受診のためには、一般市民が症状と対処を理解している必要がある。我々のこれまでの一般市民対象の脳卒中に関する知識調査から、一般集団に対する啓発活動の手法として最も強

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い影響力を持つものは新聞やテレビなどのマスメディア、およびマスメディアとチラシなどの複合的取り組みであると考えられた[1]。そのため、脳卒中の予防・症状・治療等を取り上げたマスメディアによる啓発活動を1年間通して行うことにより、一般市民の脳卒中に関する知識がどの程度向上するか検証することを目的とした介入研究を実施した[2]。以下に、この大規模介入研究の内容と結果を、マスメディアによる脳卒中キャンペーンの内容を中心に説明する。

2．マスメディアによる脳卒中キャンペーンの内容

介入地域（岡山市）では、平成21年4月中旬から平成22年3月まで、NHK岡山放送局による「脳卒中防止キャンペーン」が実施された。キャンペーンの主な内容は、"1分間スポット"と"ローカルニュースでの特集"であった。

【1分間スポット】
・ 朝・昼の連続ドラマ前、午後4時台、午後10時台
・ 年間総放映回数は約900回
・ 1分間スポットの内容
「脳卒中とは」
「脳卒中〜気づき編」
「脳卒中〜高血圧編」
「脳卒中〜不整脈編」
「脳卒中〜温度変化に注意」
「脳卒中〜早朝高血圧に注意」、など

【ローカルニュースでの特集】
・ 約15分の特別番組
・ 主に毎週水曜日午後7時のニュースの前の地方ニュース枠で放送

・ ローカルニュースでの特集の内容
「突然あなたを襲う『脳卒中』」
「脳の中で何が起きるのか」
「脳梗塞の後遺症を減らせ」
「脳卒中の危険性を知る〜体験リポート」
「脳卒中患者40％が異常放置」
「早期リハビリで後遺症減らせ」
「気づきにくい脳卒中の症状」
「すばやく見つけるには」
「倉敷市が脳卒中発症者の調査」
「水分補給が大事」
「予防メニュー」
「導入進む倉敷病院前脳卒中スケール」
「脳卒中地域連携話し合う会議」
「保健師が脳卒中の勉強会」
「すばやく病院に運ぶには（地域の救急体制）」
「県の対策」
「救急隊密着　そのとき患者は」
「医師が救急隊と症例を検討」
「脳卒中対策基本法原案まとまる」
「脳卒中防ぐ夏の生活」
「脳ドックで予防」
「県で初めての脳卒中の救急講習会」
「救急隊講習会」
「脳卒中患者を診断する講習会」
「地域で知識普及を」
「健康診断で見つけたい危険」
「患者の声を行政に」
「前触れを見逃すな〜ＴＩＡとは」
「温度変化に注意」
「津山地域脳卒中患者の76％専門病院へ」
「病院連携の最新システム」
「脳卒中専門医と開業医が勉強会」
「脳卒中無料診断イベント」
「退院後の生活支えるソーシャルワーカー」

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「脳卒中搬送2時間以内は32%」
「脳卒中を考えるシンポジウム」
「危険な高血圧」
「脳卒中発症視覚異常に気づかず」、など

3．マスメディアによる脳卒中キャンペーンの評価

マスメディアによる啓発活動の効果を科学的に検証するため、平成21年4月中旬から平成22年3月に実施されたNHK岡山放送局による「脳卒中防止キャンペーン」の前後それぞれで電話帳から無作為抽出を行い、介入地域（岡山市）と対照地域（呉市）に居住する40-74歳の者3,920名（各時期、各地域980名）に対して脳卒中初発症状についての電話調査を実施した。

脳卒中初発症状は正答5症状（①片麻痺；突然、片方の手足や顔半分の麻痺・痺れが起こる、②言語障害；突然、呂律が回らなくなったり、言葉が出なくなったり、他人の言うことが理解できなくなる、③激しい頭痛；突然、経験したことのない激しい頭痛がする、④ふらつき；突然、力はあるのに立てなかったり、歩けなかったり、フラフラする、⑤視覚障害；突然、片方の目が見えなくなったり、物が二つに見えたり、視野が半分に欠ける）とダミー5症状（①鼻出血；突然、鼻血が出る、②発熱；急に、発熱する、③左背部痛；突然、左側の肩が痛くなる、④両手指の痺れ；両手の指先が痺れる、⑤呼吸困難；突然、息苦しくなる）からなる10症状から正しいと思うものをすべて選択するよう求めた。そして、正答5症状すべてを選択した者（全10症状選択者は除く）を5症状正答者と定義した。

4．マスメディアによる脳卒中キャンペーンの

効果

介入地域の対象者において、介入後調査で"1分間スポット"を見たことがあると答えた者は、男性で33.3%、女性で45.5%であった。"ローカルニュースでの特集"を見たことがあると答えた者は、男性で22.3%、女性で34.3%であった。

介入前調査での5症状正答割合は、介入地域 53%（95%信頼区間：50-55%）、対照地域46%（95%信頼区間：43-49%）であった。1年間の介入後、介入地域のみ5症状正答者割合が有意に増加した（介入地域：63%，60-65%、対照地域：51%，48-54%）。男女別の検討では、女性では、介入前調査での5症状正答割合は、介入地域52%（95%信頼区間：50-55%）、対照地域49%（95%信頼区間：46-52%）であった。1年間の介入後、介入地域のみ5症状正答者割合が有意に増加した（介入地域：68%，66-71%、対照地域：54%，51-56%）。男性では、介入前調査での5症状正答割合は、介入地域53%（95%信頼区間：50-56%）、対照地域43%（95%信頼区間：41-46%）であった。1年間の介入後、介入地域、対照地域ともに5症状正答者割合の有意な上昇は認められなかった（介入地域：58%，55-60%、対照地域：48%，45-51%）。このことより、マスメディアによる1年間の啓発活動は一般市民、特に女性において、脳卒中初発症状の認識向上に効果的であることが示された。

5．まとめ

国民を対象とした啓発手段として大きな影響力を持つと考えられるマスメディアの影響を大規模介入研究により科学的に評価した。その結果、テレビを主体とした集中的な脳卒中キャンペーンは、一般市民（特に女性）の

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脳卒中初発症状の認識を向上することに効果的であった。一方、このような大規模な脳卒中キャンペーンの問題点としては費用の面が挙げられる。番組コンテンツ等の製作コストや電波料を考えると、そのまま一般化することは現実的ではないと考えられる。そのため、既存の映像コンテンツ等を集約して蓄積し、安く配信できるような仕組みが今後必要である。

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大阪府豊能医療圏における糖尿病実態と連携手帳所持率調査

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豊能医療圏糖尿病地域連携クリティカルパス検討会議

要約：大阪府豊能圏域において保険薬局に院外処方箋を持参した糖尿病患者を対象に糖尿病診療実態を調査した．アンケートを回収できた 1,026 名の，平均年齢は 66.9 歳，男女比は女性が 36.6 ％，平均通院期間は約 10 年，平均 HbA1c 値は 7.2 ％であった．血糖コントロール優または良の範囲にある患者は 31 ％であり，不可の割合は 12.8 ％であった．また，9.8 ％が HbA1c 値を把握していなかった．さらに，32.1 ％が眼科を受診しておらず，糖尿病連携手帳所持率は 15.6 ％にとどまっていた．多変量解析の結果，HbA1c 値（高値）と相関する項目は，年齢（若年），性別（女性）および通院期間（長期）であり，眼科定期受診と相関する項目は，年齢（高齢），性別（女性），通院期間（長期），糖尿病入院歴および連携手帳所持であった．連携手帳所持者では，そのほとんどが，HbA1c 値を把握し，また眼科を定期受診しており，望ましい療養行動につながっていた．今後，糖尿病連携手帳のさらなる普及とともに，地域での多診療科・多職種の密接な連携をさらに推進することが必要であると考えられる．

Key words：糖尿病地域連携，糖尿病連携手帳（用語集に記載なし），不可の割合（用語集に記載なし），眼科定期受診（用語集に記載なし），薬局アンケート（用語集に記載なし）

〔糖尿病 56(8)：543〜550, 2013〕

緒　言

　近年日本の糖尿病人口は年々増加傾向にあり，平成 23 年度には 1,000 万人以上と推定されている[1]．糖尿病は，心筋梗塞や脳卒中，人工透析などのハイリスクグループであるため，その診療においてこれらの合併症をいかに予防してゆくかが極めて重要である．しかしながら，平成 22 年国民健康・栄養調査（厚生労働省）によると，糖尿病といわれたことがある人のうち，継続的に治療を受けているのは，全体で約 6 割に過ぎず，特に 30〜40 歳代では半数の人が糖尿病診療を受けていない現状が浮き彫りになっている[2]．他方，通院して薬剤治療を受けている糖尿病患者においても，その約 7 割が目標値に血糖コントロールされていないことが

報告されており[3]，合併症が十分に予防できていないことが懸念されている．糖尿病専門医に比べて糖尿病患者数は圧倒的に多く，糖尿病患者の 8 割が非専門医で診療を受けている現状があるため，地域における専門医とかかりつけ医の医療連携が合併症予防のために必須である[4,5]．大阪府豊能医療圏は，その特徴として，専門病院を中心に早くから圏域内の病院・診療所と連携が進められてきた地域である[6]．他地域に比較して診療所数も多く，医療へのアクセスは良好と考えられている．そこで今回，医療先進地区と考えられる豊能圏における糖尿病患者地域診療実態を把握するために圏域の保険薬局の協力のもとで糖尿病患者を対象にアンケート調査を行った．

対象と方法

アンケート収集法

豊能圏域薬剤師会の協力で平成23年12月から平成24年2月までの3ヶ月間に豊能2次医療圏の約350 (吹田市125, 豊中市120, 箕面市52, 池田市50) の保険薬局に糖尿病薬の処方箋を持参した患者の内, 本調査に口頭同意を得られた方を対象として糖尿病診療実態アンケートを行った. 合計1,138枚を回収し, 有効回答が得られた1,026枚を解析した.

調査項目

アンケートの項目は, 下記の10項目である.

1. 年齢（　才）
2. 性別（男・女）
3. 糖尿病で通院し始めてからおよそ何年たちますか？（　）
4. 糖尿病の治療（教育入院を含む）で, 入院したことはありますか？（ある・ない）
5. 普段の糖尿病薬はどちらで処方されていますか？（病院・診療所）
6. 最近のあなたのHbA1cはどのくらいですか？近い数字に〇をしてください.（知らない・5・6・7・8・9・10以上）
7. あなたは定期的に眼科を受診していますか？（受診していない・定期的に受診
⇒年に数回・年に1回ぐらい・2〜3年に1回ぐらい）
8. あなたは糖尿病連携手帳を持っていますか？（有・無）
［以下の質問は, 糖尿病連携手帳を持っている患者さんに伺います］
9. 糖尿病連携手帳は, 普段どのように携帯していますか？
（外出時に常に携帯・通院時のみ携帯・自宅においてあることが多い）
10. 糖尿病連携手帳と主治医の説明を聞いて, 専門病院と診療所が協力して診療していることが理解できましたか？（理解できた・わからない）

HbA1c調査

HbA1cについては,「知らない」の選択肢に加えて5％未満-10％以上のスケール尺度とした. 調査段階では臨床的にJDS値が用いられており, 本論文では, 換算式（NGSP値（％）= 1.02×JDS値（％）+ 0.25％）により計算したNGSP相当値[7]を用いた.

統計解析

データは平均値+/-標準偏差（SD）で表した. 群間の平均値の比較には分散分析（ANOVA）を用い, 関係する因子の検定についてはカイ2乗検定を用いた.

$P < 0.05$を統計的に有意とし, 解析には統計ソフトJMP 7.0.1（SAS institute, USA）を使用した. 血糖コントロールの指標としてHbA1c値と相関する因子を明らかにする目的でHbA1c値を従属変数, 年齢, 性別, 糖尿病罹病期間, 糖尿病入院歴, 処方箋交付元, 眼科定期受診の有無, 糖尿病連携手帳持参の有無を独立変数とする単回帰分析および重回帰分析を行った.

また, 療養行動としての眼科定期受診に関わる因子を明らかにする目的で眼科定期受診の有無を従属変数とした解析は, 年齢, 性別, 糖尿病罹病期間, HbA1c（NGSP）値, 糖尿病入院歴, 処方箋交付元, 糖尿病連携手帳持参の有無を独立変数とする多重ロジスティック回帰分析を行った. 罹病期間とHbA1c値は自然対数変換後に統計解析した. 説明変数がカテゴリ変数の場合はダミー変数を作成して数値化の上解析を行った. 各項目間の相関係数は, 糖尿病手帳所持と入院歴（r = 0.270）が最高であり, 年齢と通院期間（r = 0.266）, 通院期間と入院歴（r = 0.232）, それ以外の組み合わせは0.2未満であった. 多重共線性の原因となる各因子間の強い相関関係は認めなかったため, これらを共変量として解析した.

倫理的側面

本研究は, ヘルシンキ宣言（1964年6月世界医師会総会[8], 2008年10月ソウル改訂）を基礎として厚生労働省, 文部科学省の「疫学研究に関する倫理指針」（平成20年12月1日改正）に準拠し, 国立循環器病研究センター倫理委員会による研究計画の承認を受けている（承認番号M24-007）.

結　果

1. データの概要

今回調査に協力した患者全体のデータをTable 1に示す. 平均年齢は66.9+/-10.8歳であり, 60代と70代前半が6割弱を占めていた. 最年少は14歳, 最年長が96歳であった. 糖尿病通院期間は平均10年であり, 5年以内が約3割, 5-10年が約2割, 10-15年が約2割, 15年以上は約3割であった. 糖尿病通院開始年齢は, 11歳から89歳（平均56.8+/-12.0歳）であり, 入院歴, 眼科受診, HbA1c高値と有意な逆相関を認めた. 39.6％に糖尿病入院歴があり, 62.9％が病院から糖尿病薬の処方箋を交付されていた.

2. 男女別の検討

性別は, 女性が37％, 男性が63％であった. 男女別年齢は, 女性68.1+/-10.8歳, 男性66.2+/-10.8歳であった. 全体の平均糖尿病通院期間に性差を認めなかったが, 女性で通院開始年齢が遅かった（女性58.5+/-12.3歳, 男性55.9+/-11.7歳, $p < 0.01$）. 年

Table 1 患者概要と記入率

	平均 +/− 標準偏差	記入率 (%)
年齢	66.9 +/− 10.8	1015 (98.9)
糖尿病通院期間(月)	120 +/− 103	1021 (99.5)
HbA1c (%)	7.22 +/− 0.98	926 (90.3)
	n (%)	記入率 (%)
性別 (女性)	376 (36.6)	1025 (99.9)
糖尿病入院歴	406 (39.6)	1026 (100)
院外処方箋 (病院)	642 (62.9)	1021 (99.5)
眼科定期受診	696 (67.9)	1025 (99.9)
連携手帳所持	160 (15.6)	1024 (99.8)

Table 2 HbA1c と相関する項目 (多変量解析)

項目	回帰係数	標準誤差	χ^2	p	95% 信頼区間
年齢	−0.0020	0.0004	19.45	0.0001*	−0.0028, −0.0011
性別 (女性)	0.0187	0.0092	4.06	0.0439*	0.0005, 0.0368
Log [通院期間]	0.0197	0.0043	20.95	0.0001*	0.0113, 0.0281
糖尿病入院歴	0.0123	0.0096	1.66	0.1976	−0.0064, 0.0311
処方箋 (病院)	0.0076	0.0092	0.69	0.4058	−0.0104, 0.0257
眼科定期受診	0.0137	0.0101	1.85	0.1734	−0.0061, 0.0335
連携手帳所持	−0.0046	0.0123	0.14	0.7070	−0.0287, 0.0195

齢・HbA1c 値・糖尿病入院歴で調整後も，通院開始年齢は男性に比較して女性で有意に高く，男女差は平均 1.49+/−0.54 年 (95 %信頼区間 0.43-2.55) であった．通院開始年齢と性別の関係を各年代別に検討すると 50 歳から 74 歳までの間では平均通院開始年齢に性差を認めなかったが，50 歳未満では男性がより高齢で (女性 32.2+/−11.2 歳，男性 37.5+/−6.3 歳，p＝0.016)，75 歳以上では女性がより高齢で (女性 67.9+/−7.8 歳，男性 62.6+/−9.7 歳，p＝0.002)，糖尿病通院を開始していた．また，血糖コントロール別に，通院開始年齢の性差を検討すると，血糖コントロール不十分の領域で女性の通院開始年齢が高い結果であった (女性 59.9+/−10.1 歳，男性 55.4+/−11.1 歳，p＝0.0028)．入院歴，処方箋交付元，平均 HbA1c 値，糖尿病連携手帳所持率に男女差は認めなかった．

3. 血糖コントロール

HbA1c (NGSP) 値の平均と標準偏差は，7.22+/−0.98 % (HbA1c (JDS) 値 6.82+/−0.98 %) であった．HbA1c 値と相関する因子を多変量解析したところ，年齢 (若年)，性別 (女性)，糖尿病通院期間 (長期) が有意に HbA1c 値高値と相関していた(Table 2)．血糖管理の程度を優 (HbA1c (NGSP) 値 6.2 %未満)・良 (6.2-6.8 %)・不十分 (6.9-7.3 %)・不良 (7.4-8.3 %)・不可(8.4 %以上)と区分した場合，その割合はそれぞれ，8.6 %・22.0 %・23.0 %・24.4 %・12.5 %であり，優ま

たは良のコントロール目標に到達している患者は 31 %で，約 6 割が血糖管理目標に達していなかった (Fig. 1A)．また，「HbA1c 値を知らない」と回答した患者は 9.8 %であった．各血糖管理区分の割合を糖尿病通院開始時からの時間経過を見ると 4 年目までは優・良の範囲が大半であるが，以後不十分が多くなり 15 年目を境に不良が最も多くなっていた．また血糖コントロール不可の割合はどの時期でも 10-15 %存在する結果であった．HbA1c を知らない割合は，通院開始後 1-2 年に最も多く (23.2 %)，以後減少していた (Fig. 1B)．

血糖コントロールを年代毎に検討すると，各年齢カテゴリー間で HbA1c (NGSP) 値は有意な差を認めた (trend p＝0.003)．50 歳未満(62 人)7.16+/−0.97 %，50-54 歳 (49 人) 7.35+/−0.99 %，55-59 歳 (79 人) 7.51+/−1.14 %，60-64 歳 (167 人) 7.35+/−1.12 %，65-69 歳 (180 人) 7.24+/−1.02 %，70-74 歳 (191 人) 6.98+/−0.80 %，75-79 歳 (120 人) 7.21+/−0.86 %，80 歳以上 (91 人) 7.11+/−0.93 %であり，55-59 歳代が高い結果であった．また，血糖管理が不可 (HbA1c (NGSP) 値が 8.4 %以上) の割合は，男性では 50 歳代後半の年齢層で最も高くなっており，働き盛りから定年前の世代が特にコントロール不良であった (Fig. 1 C 青)．一方女性では，50 代前半と 60 代前半に不可の割合が高くなっていた(Fig. 1C 赤)．男女とも 70 代
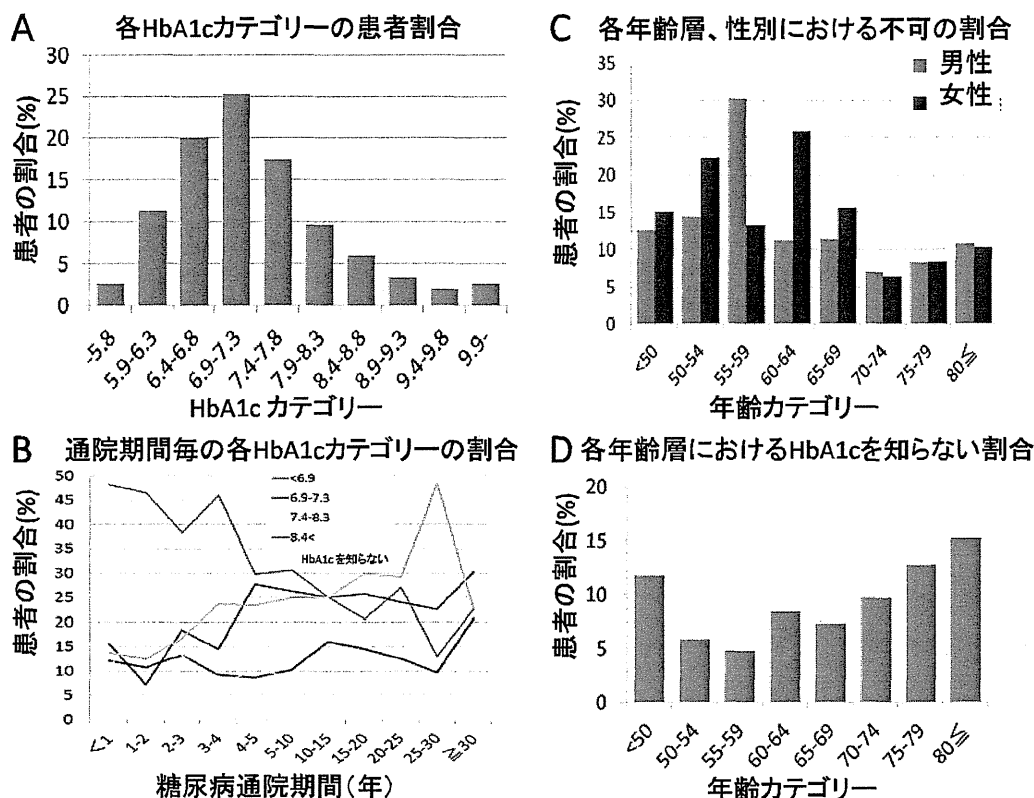
A　各HbA1cカテゴリーの患者割合

B　通院期間毎の各HbA1cカテゴリーの割合

C　各年齢層、性別における不可の割合

D　各年齢層におけるHbA1cを知らない割合

Fig. 1　豊能医療圏糖尿病実態
（左上，A）全体を 100 % とした各 HbA1c カテゴリーのパーセンテージ
（左下，B）各血糖コントロールカテゴリー（優良・不十分・不良・不可）の割合と糖尿病通院期間
（右上，C）各年齢層，性別における血糖コントロール不可（HbA1c 8.4 % 以上）の割合
（右下，D）各年齢層における HbA1c を「知らない」と答えた患者の割合

以上では不可の割合は半減していた.

4. HbA1c 認知度

HbA1c 値を把握していない割合は高齢者に多く，80 歳以上では 15 % 以上であった（Fig. 1D）. また，50 歳未満の若年者においても自分の値を把握している度合が低かった（HbA1c 値を「知らない」が 11.8 %）. 80 歳未満を対象に HbA1c の認知度と相関するパラメータを多重ロジスティック解析したところ，年齢（p＝0.246），性別（p＝0.956），通院期間（p＝0.138），糖尿病入院歴（p＝0.175），院外処方箋発行元（p＝0.868），眼科定期受診（p＝0.001），糖尿病連携手帳所持（p＝0.008）であり，眼科定期受診と糖尿病連携手帳所持がそれぞれ独立して有意に相関していた. 年齢カテゴリー別に解析すると HbA1c 値の把握割合は，55-64 歳の年代で眼科定期受診と有意な相関関係があり（p＜0.01），特にこの世代において病識が療養行動につながっていた. 他方，80 歳以上の年代では，HbA1c 値の把握は糖尿病入院歴と有意に相関していた.

5. 眼科定期受診率および連携手帳所持との関連

今回のアンケートでは，眼科受診頻度は，年数回が

32 %，年 1 回が 23 %，数年に 1 回が 14 %であり，受診していないと回答した割合が 31 %あった. すなわち，年 1 回以上眼科を受診している方は約半数であり，約 3 分の 1 が眼科を定期受診していなかった. 眼科定期受診と有意な相関が認められた項目は，単相間では，年齢（高齢），性別（女性），通院期間（長期），HbA1c（高値），糖尿病入院（あり）および連携手帳（所持）であった. 処方箋交付元（病院または診療所）で眼科定期受診行動に差を認めなかった. 多変量解析では，年齢（高齢），性別（女性），通院期間（長期），糖尿病入院歴（あり），連携手帳（所持），の各項目が独立して有意な相関を認めた（Table 3）. 各年齢カテゴリー別に解析した眼科定期受診率は，50-70 歳の糖尿病連携手帳所持者で明らかに高かった（50-54 歳 p＝0.022，55-59 歳 p＝0.044，60-64 歳 p＝0.009，65-69 歳 p＝0.035）（Fig. 2A）. 各年代におけるこれらの相関関係も，性別，通院期間，糖尿病入院歴とは独立していた.

6. 糖尿病連携手帳所持率および所持形態

今回のアンケートの結果，糖尿病連携手帳を活用している患者は，全体の 15.6 %にとどまっていた（Table

Table 3 眼科定期受診と相関する項目（多変量解析）

| 項目	回帰係数	標準誤差	χ^2	p	95％信頼区間	オッズ比（信頼限界）
年齢（1歳毎）	0.021	0.008	6.820	0.009*	0.005, 0.037	1.021（1.005-1.037）
性別（女性）	0.426	0.174	6.000	0.014*	0.088, 0.771	1.531（1.092-2.163）
Log［通院歴］	0.251	0.075	11.390	0.001*	0.105, 0.398	1.286（1.111-1.489）
糖尿病入院歴	0.434	0.176	6.060	0.014*	0.091, 0.783	1.544（1.095-2.188）
院外処方箋（病院）	0.114	0.166	0.480	0.490	−0.212, 0.438	1.121（0.809-1.550）
Log［HbA1c（％）］	0.773	0.629	1.510	0.219	−0.451, 2.017	2.167（0.637-7.519）
連携手帳所持	0.904	0.273	10.960	0.001*	0.389, 1.465	2.469（1.476-4.326）
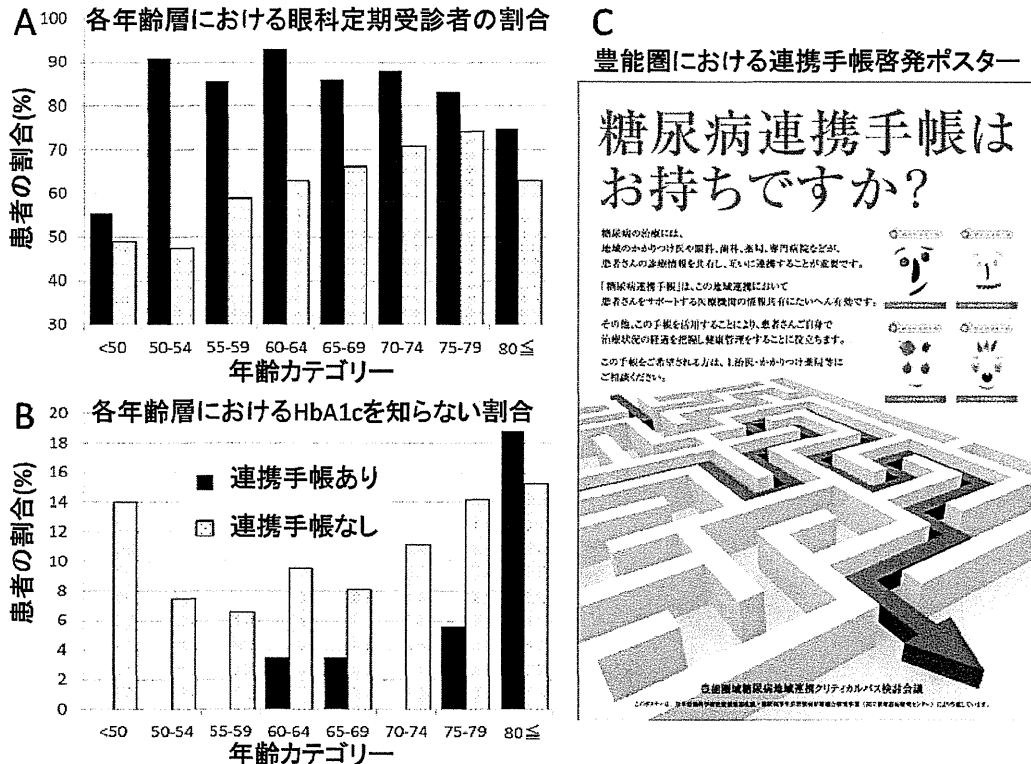
Fig. 2 豊能医療圏糖尿病患者の自己管理に及ぼす連携手帳の意義と啓発
（左上，A）各年齢層における眼科定期受診者の割合（■連携手帳所持，□連携手帳非所持）
（左下，B）各年齢層における HbA1c を知らない割合（■連携手帳所持，□連携手帳非所持）
（右，C）豊能圏における連携手帳啓発ポスター「糖尿病連携手帳はお持ちですか？」

1）. 連携手帳持参者のうち,「自宅においていることが多い」(61％),「通院に持参する」(26％),「常に携帯する」(10％)と所持形態は様々であったが，糖尿病医療連携に対して「理解できた」と回答した割合は，それぞれ，70％，72％，88％と，常に携帯している方が有意に高かった（p＝0.0037）.

7. 糖尿病連携手帳所持と糖尿病入院歴および血糖コントロールの関連

連携手帳所持は糖尿病入院歴と有意な相関があった（r＝0.22，p＜0.0001）. 入院歴ありと答えた患者の27.5％が手帳を所持しており，入院歴なしの8.1％に比較して有意に高率であった. 他方で，手帳所持者の69％に入院歴があった（手帳非所持者では34％であった）.

連携手帳所持と入院歴の有無で4群に分けた各群のHbA1c値の平均＋／−標準誤差（95％信頼区間）は，入院歴のある患者では，手帳あり群（106人）で7.35＋／−0.10（7.15-7.56），手帳なし群（270人）で7.31＋／−0.06（7.19-7.44），入院歴のない患者では，手帳あり群（47人）で7.17＋／−0.13（6.90-7.43），手帳なし群（481人）で7.13＋／−0.04（7.05-7.21）であり，手帳所持の有無で血糖コントロールには有意な差を認めなかった.