

Figure 3 Non-high-density lipoprotein cholesterol (HDL-C) and mortality as a result of diabetes and total diabetes events. The highest non-HDL-C quartile (≥ 163 mg/dL) had a significantly higher mortality as a result of diabetes than the lowest and second highest quartile ($P = 0.030$ and $P = 0.019$, respectively). The accumulated incidence of total diabetes events was also significantly higher in the highest non-HDL-C quartile (≥ 163 mg/dL) than the lowest, second lowest and second highest quartiles ($P = 0.003$, $P = 0.031$, and $P = 0.008$, respectively).

lowest or second highest quartiles ($P = 0.003$, $P = 0.031$ and $P = 0.008$, respectively). Stroke incidence tended to be greatest in the highest non-HDL-C quartile ($P = 0.099$; *vs* the lowest quartile, $P = 0.076$; *vs* the second lowest quartile, $P = 0.080$; *vs* the second highest quartile). Similarly, cardiovascular event also tended to be increased in the highest non-HDL quartile compared with the second lowest ($P = 0.065$) and second highest quartiles ($P = 0.088$).

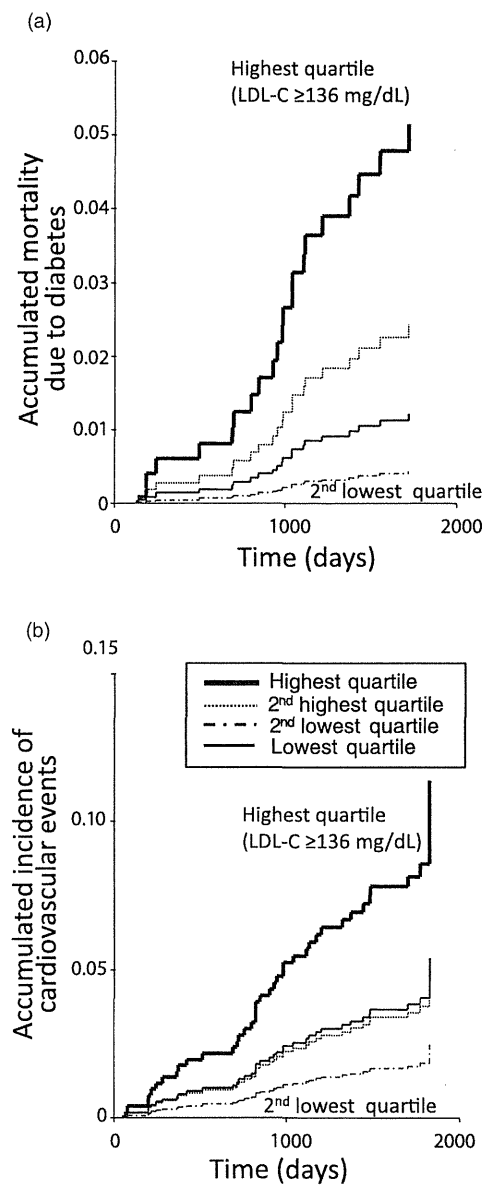


Figure 4 Low-density lipoprotein cholesterol (LDL-C) and mortality as a result of diabetes and incidence of cardiovascular events. The incidence of cardiovascular events or mortality as a result of diabetes was highest in the highest LDL-C quartile (≥ 136 mg/dL) and lowest in the second lowest LDL-C quartile (99–116 mg/dL). This suggests the existence of a J-curve incidence for stroke according to LDL-C distribution.

Figure 4a and b show that cardiovascular event or diabetes-related mortality incidence was greatest in the highest LDL-C quartile (≥ 136 mg/dL) and lowest in the second lowest LDL-C quartile (99–116 mg/dL). This suggested the existence of a J-curve incidence for stroke according to LDL distribution.

Figure 5a and b show that the highest HbA1c quartile ($\geq 8.8\%$) had a significant increase in the incidence of

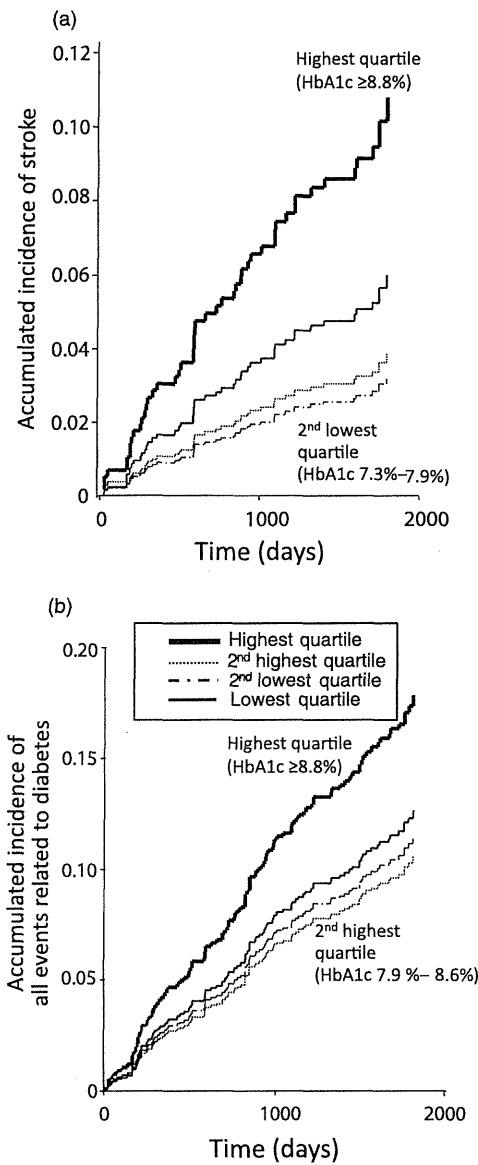


Figure 5 Glycated hemoglobin A1c (HbA1c) and incidence of stroke or all events related to diabetes. The highest HbA1c quartile ($\geq 8.8\%$) had an increased incidence of stroke compared with the second lowest ($P = 0.003$), second highest ($P = 0.008$) and lowest ($P = 0.092$) quartiles. The incidence of stroke was lowest in the second lowest HbA1c quartile (7.3–7.9%). This suggests the existence of a J-curve incidence of stroke according to HbA1c distribution. The highest HbA1c quartile ($\geq 8.8\%$) had a significant increase in diabetes-related events compared with the second lowest ($P = 0.031$) and second highest quartiles ($P = 0.058$), but not the lowest quartile group.

stroke and total diabetes-related events compared with the second lowest HbA1c quartile ($P = 0.003$ for stroke and $P = 0.031$ for total diabetes events). Interestingly, stroke incidence was lowest in the second lowest HbA1c quartile (7.3–7.9%) compared with the other three quartiles, resulting in a J-curve incidence for stroke

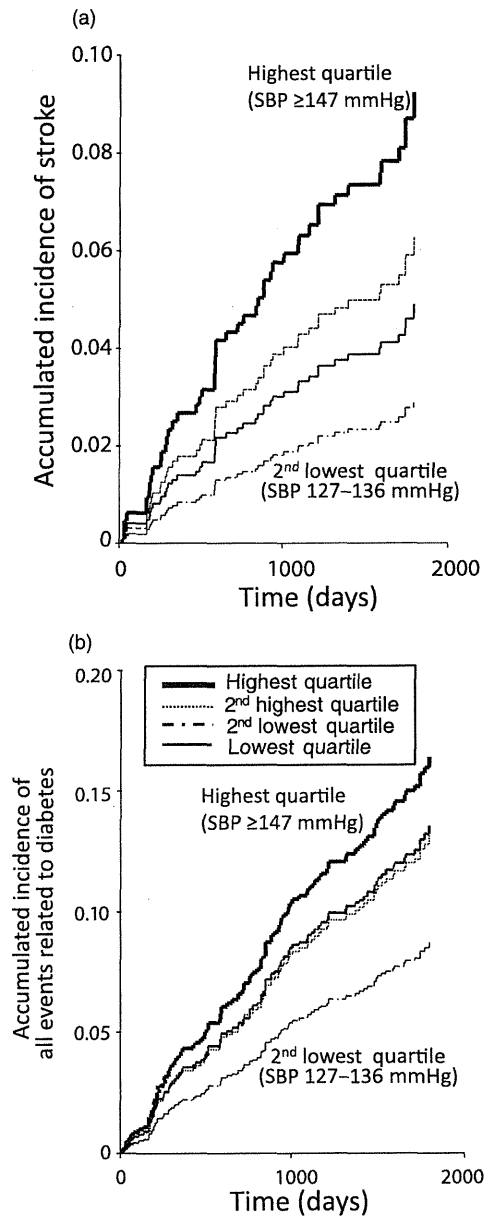


Figure 6 Systolic blood pressure (SBP) and incidence of stroke or all events related to diabetes. The highest SBP quartile (≥ 147 mmHg) had an increased incidence of stroke compared with the second lowest (127–136 mmHg; $P = 0.013$) and lowest (< 127 mmHg; $P = 0.083$) quartiles. The incidence of total diabetes events in the highest SBP quartile (≥ 147 mmHg) was significantly greater than only the second lowest quartile ($P = 0.023$). This suggests the existence of a J-curve incidence of stroke according to SBP distribution.

according to HbA1c distribution. Similarly, the highest SBP quartile (≥ 147 mmHg) had an increased incidence of stroke and total diabetes-related events compared with the second lowest SBP quartile (127–136 mmHg; $P = 0.013$ for stroke and $P = 0.023$ for total diabetes-related events; Fig. 6a,b). The incidence of stroke or total diabetes-related events was also lowest in the

Table 3 Variables associated with incident composite events in multivariate Cox regression analyses after the landmark time

	Number of events	Significant variables	Hazard ratio (95%CI)	Significance
CVE (fatal MI + non-fatal MI + angina pectoris + coronary revascularization)	35	Age	1.028 (0.955–1.107)	0.460
		Sex	0.663 (0.328–1.342)	0.253
		HbA1c	1.182 (0.856–1.631)	0.309
		LDL-C	1.011 (1.000–1.021)	0.045
		HDL-C	0.996 (0.973–1.019)	0.705
		SBP	1.004 (0.983–1.026)	0.706
Stroke	48	Age	1.080 (1.016–1.148)	0.013
		Sex	0.466 (0.255–0.850)	0.013
		HbA1c	1.364 (1.093–1.701)	0.006
		Non-HDL-C	1.010 (1.001–1.018)	0.029
		HDL-C	1.003 (0.985–1.022)	0.734
		SBP	1.017 (0.999–1.035)	0.067
Diabetes-related mortality	21	Age	1.123 (1.023–1.232)	0.015
		Sex	0.471 (0.188–1.180)	0.108
		HbA1c	0.851 (0.516–1.402)	0.526
		Non-HDL-C	1.019 (1.007–1.031)	<0.001
		HDL-C	1.019 (0.991–1.047)	0.183
		SBP	0.994 (0.966–1.023)	0.691
Total diabetes events (CVE + stroke + sudden death + renal death + diabetic foot + heart failure)	108	Age	1.081 (1.038–1.125)	<0.001
		Sex	0.560 (0.376–0.834)	0.004
		HbA1c	1.149 (0.957–1.378)	0.136
		Non-HDL-C	1.008 (1.002–1.014)	0.005
		HDL-C	1.004 (0.991–1.017)	0.532
		SBP	1.008 (0.996–1.019)	0.215

CVE, cardiovascular event; DBP, diastolic blood pressure; HbA1c, glycated hemoglobin A1c; HDL-C, high-density-lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; MI, myocardial infarction; SBP, systolic blood pressure.

second lowest SBP quartile, showing a J-curve incidence for stroke according to SBP distribution.

Table 3 shows the variables that were significantly associated with incident composite events. Using six variables (age, sex, HbA1c, SBP, non-HDL-C and HDL-C), non-HDL-C was significantly and independently associated with increased risk of stroke, diabetes-related mortality and total events. The adjusted hazard ratios (95% CI) for non-HDL-C were 1.010 (1.001–1.018, $P=0.029$) for stroke, 1.019 (1.007–1.031, $P<0.001$) for diabetes-related mortality and 1.008 (1.002–1.017; $P=0.005$) for total diabetes-related events. When LDL-C was added to the model for total diabetes-related events, non-HDL-C remained significant ($P=0.007$), whereas LDL-C did not. The significant association between non-HDL-C and total diabetes-related events persisted after the addition of statin treatment to the model ($P=0.005$).

High HbA1c was also independently associated with incident stroke. Using six variables (age, sex, HbA1c, SBP, LDL-C and HDL-C), LDL-C was the only significant predictor for cardiovascular events ($P=0.045$).

Discussion

The significance of several risk factors, such as serum lipid abnormalities and increased HbA1c, for stroke and mortality has not been shown clearly in elderly type 2 diabetes patients. The present study used a landmark analysis to show that non-HDL-C, SBP and HbA1c were independent predictors for stroke development during a 6-year follow-up period. A weak, significant association between non-HDL-C and stroke was found in agreement with several prospective studies.^{9,10} In the Emerging Risk Factors Collaboration study on 302 430 people from 68 long-term prospective studies, the hazard ratios for ischemic stroke were 1.12 (95%CI:1.04–1.20) for non-HDL-C and 1.02 (95%CI:0.94–1.11) for triglycerides. However, the hazard ratio for ischemic stroke was approximately fourfold weaker than that for coronary heart disease.⁹ The Women's Health Study also showed that compared with the lowest non-HDL-C quintile, the highest quintile had multivariate-adjusted hazard ratios for ischemic stroke of 2.45 (95%CI:1.54–3.91), higher than the ratios for HDL-C or LDL-C¹⁰. These

findings show non-HDL-C might be an important risk factor for stroke, even in elderly diabetes patients.

We also showed that non-HDL-C predicted diabetes-related mortality and total diabetes-related events. The predictive power of non-HDL-C for mortality was stronger in high-risk CHD patients associated with vascular intervention, chronic renal failure or diabetes mellitus.¹¹⁻¹⁵ In the Pravastatin or Atorvastatin Evaluation and Infection Therapy–Thrombolysis in Myocardial Infarction 22 Investigators (PROVE IT-TIMI 22) trial on acute coronary syndrome patients receiving either pravastatin 40 mg or atorvastatin 80 mg, non-HDL-C, HDL/TC and Apolipoprotein (Apo) B / Apo A1 predicted death or acute coronary events.¹¹ In the Bypass Angioplasty Revascularization Investigation (BARI) Study, non-HDL-C was a strong and independent predictor of non-fatal MI and angina pectoris at 5 years compared with LDL-C or triglycerides, even after adjustment for potential covariates in patients undergoing angioplasty revascularization or bypass-surgery.¹² Nishizawa *et al.* showed that non-HDL-C in predialysis serum was a significant and independent predictor of cardiovascular mortality in hemodialysis patients.¹³ In the European Community funded Concerted Action Programme into the epidemiology and prevention of diabetes (EURODIAB) Prospective Complication Study, non-HDL-C, age, pulse pressure and waist-to-hip ratio were independent predictors for all-cause mortality in type 1 diabetes patients.¹⁴ Herman *et al.* showed the discriminatory power of non-HDL-C was similar to Apo-B in diabetes patients because of the discriminant ratio and unbiased equation of equivalence.¹⁵ Non-HDL-C was also shown to be a better predictor of CVD mortality or acute myocardial infarction (AMI) than LDL-C or TC.¹⁶⁻¹⁸ In the present study, the predictive potential of non-HDL-C was stronger in diabetic patients who had a residual risk beyond LDL-C.

Our finding in the landmark study that patients with a non-HDL-C > 163 mg/dL had a significantly increased incidence of stroke, diabetes-related death and total events compared with those with a non-HDL-C < 122 mg/dL suggests that lipid lowering with a statin is of considerable importance, even in the elderly diabetes patients. This result is in agreement with a report from the Japanese Circulatory Risk in Communities Study¹⁹ showing an association between non-HDL-C and CHD incidence, with the greatest discriminative power at non-HDL-C > 140 mg/dL. In contrast, in the National cholesterol education program-III (NCEP-III) guidelines, the optimal goal of non-HDL-C in CHD patients was <100 mg/dL.¹⁷ The decrease in non-HDL-C after the landmark time in both our intensive and conventional treatment groups might represent an effect of statin treatment, and might also explain the differences in events described here. In the Collaborative Atorvastatin

Diabetes Study, treatment decreased both LDL-C and non-HDL-C, leading to prevention of stroke and cardiovascular events.²⁸ The present results suggest that even in elderly high-risk diabetes patients, a reduction of non-HDL-C using a statin might be beneficial for preventing CVD, stroke and mortality.²⁹

The reason for the lack of significant associations between non-HDL-C and cardiovascular events remains unclear. In contrast, LDL-C was a significant predictor of cardiovascular events in the present study. The differences in predictive power of non-HDL-C and LDL-C for CVD and stroke might reflect variability in the vulnerability of cerebral and coronary arteries to lipoproteins. Non-HDL-C in combination with a Apo-B100, remnant lipoproteins and small, dense lipoproteins might be involved in stroke events as a consequence of biological actions beyond LDL-C. Alternatively, the predictive power of non-HDL might be affected by age,²⁰ sex,^{21,22} ethnicity²³ and lifestyle habits.

The present data showed high HbA1c predicted stroke in elderly people with type 2 diabetes. In a Finnish elderly cohort, HbA1c and fasting, and 2-h glucose predicted stroke events.³⁰ In the Diabetes among Indian Americans (DIA) study, HbA1c and smoking were predictors for stroke in men without previous stroke, whereas therapy with insulin plus oral agents predicted stroke in men with a history of stroke.³¹

In contrast, stroke incidence in the present study was lowest in the second lowest HbA1c quartile (7.3–7.9%), resulting in a J-curve incidence for stroke according to HbA1c distribution. The study on the UK General Practice Database showed low and high HbA1c were both associated with increased large-vessel disease and all-cause mortality in 27 965 diabetic patients,³² possibly because of hypoglycemia, leading to arrhythmia, cardiovascular autonomic abnormalities, QT prolongation, and induction of prothrombotic and proinflammatory markers. Moderately abnormal glucose control with HbA1c around 7.5% (JDS, 7.1%) with no hypoglycemia during follow up might have a beneficial effect on stroke in high-risk, elderly diabetic patients.

Similarly, the lowest incidence of stroke and total diabetes events in the second lowest SBP quartile (127–136 mmHg), and the lowest incidence of cardiovascular events and total diabetes events in the second lowest LDL-C quartile (99–116 mg/dL) suggest the existence of a J-curve. The J-curve effect of BP lowering has been reconsidered recently, with recommendation that aggressive BP control should be undertaken carefully in high-risk, older diabetes patients.^{33,34} A review of observational studies shows a trend where all-cause mortality was highest when TC was lowest.³⁵ Only a few randomized control trials have not provided evidence of an effect of lipid-lowering treatment on mortality in ≥80 years-of-age patients.³⁵ Although it is not possible

to disregard the possibility that comorbidities, such as inflammation and malnutrition, are associated with an increased incidence of stroke in the lowest SBP and LDL-C groups, cautious and comprehensive management of BP and LDL-C is also required in older people with diabetes.

The present study had several limitations. First, our cohort comprised high-risk, elderly Japanese subjects, and therefore our results cannot be generalized to other populations. Second, the study population was limited by a relatively small sample size compared with other published reports, and it is likely that the lack of significant relationships between variables reflects inadequate statistical power rather than a true negative result. Finally, the landmark analysis after 1 year of intervention did not completely reflect the effects of temporal changes in the parameters over the entire follow-up period, although some tracking effects of lipid parameters were observed.

In conclusion, this relatively large-scale prospective study showed non-HDL-C was an important predictor for stroke, diabetes-related mortality and total diabetes events in high-risk, elderly type 2 diabetes patients. Non-HDL-C reflected several pathological lipoproteins, including LDL-C, ApoB, triglycerides, remnant lipoproteins and small, dense lipoproteins.³⁶ Measurement of non-HDL-C might therefore be useful for evaluating the effects of lipid intervention using statin, fibrates and eicosapentaenoic acid in elderly people with diabetes. However, further studies including sophisticated randomized trials are necessary to elucidate the role of non-HDL-C on vascular events.

Acknowledgments

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Conflict of interest

There is no conflict of interest. The Japanese Elderly Diabetes Intervention Trial (J-EDIT) Study Group has not cleared any potential conflicts.

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New dorsiflexion measure device: A simple method to assess fall risks in the elderly

Dear Editor,

Hip fracture is the third leading cause yielding bedridden status in Japan, and more than 80% of hip fractures are reported to be caused by falling. There are a variety of causes for falls in the elderly, and one of the significant causes is the inability to lift their toes when they walk. Here, we show a new device to measure dorsiflexion angle, an instrument that we developed to assess fall risks in the elderly.

Participants were requested to stand up straight and step back until the hip leaned on the wall (Fig. 1a). The fulcrum of the instrument was adjusted to the center of the external malleolus (Fig. 1b). The arm of the instrument was set to stay level, adjusting the branching thin arm placed on the ridge of the dorsum of the foot. Then, participants were asked to dorsiflex as much as possible. The mean time to measure bilateral dorsiflexion angles was within 5 min.

We measured dorsiflexion and Fall Risk Index (FRI),^{1,2} including the history of falls within the past year, in 131 women (46–89 years, mean age 78.0 ± 7.1 years) and 88 men (46–93 years, mean age 76.2 ± 8.6 years) who visited the fall prevention clinic in Kyorin University Hospital. The occurrence of falls within the past year was 35.6%. Falls occurred 2.0 ± 0.1 times in fallers within 1 year, and women fell more frequently than men (42.7% vs 25.0%, $\chi^2 = 7.2$, $P \leq 0.01$). The average FRI score was 6.7 ± 3.4 in non-fallers and 10.6 ± 3.0 in fallers ($P < 0.0001$). Women showed a higher FRI score than men (8.8 ± 3.6 vs 7.0 ± 3.8 , $P = 0.003$).

This new device appears promising in detecting the high-risk group of fallers, because the dorsiflexion angle was significantly smaller in fallers than non-fallers (right 9.6 ± 8.4 vs 13.7 ± 9.6 degrees, $P = 0.012$; left 10.0 ± 8.5 vs 14.2 ± 9.8 degrees, $P = 0.014$). Furthermore, the occurrence of falls was more frequent as the dorsiflexion angle decreased in women ($\chi^2 = 6.4$, $P = 0.042$; Fig. 1c), and half of the subjects, whose dorsiflexion angle was less than 10 degrees, experienced falls within a year.

Previously, it was reported that hip fractures occur more frequently in women than men, even though the incidence rate of falls was comparable until the age of 90 years. This is considered to be a result of the higher prevalence of osteoporosis in women.³ In contrast, the present study found that women less than 90 years-of-age fell more frequently than men in the Japanese population of this age group. We also found that the FRI score was higher in women than men, as has been shown previously.⁴ In addition, dorsiflexion angle was

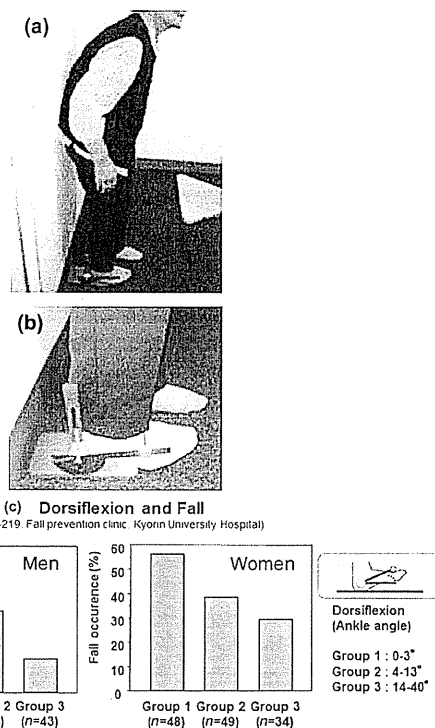


Figure 1 (a,b) How to measure dorsiflexion angle using a dorsiflexion measure device. (c) The relationship between dorsiflexion angle and the occurrence of falls within the past year. In men and women respectively, participants were grouped by tertile according to the dorsiflexion angle.

smaller in women than men (right 10.3 ± 8.4 vs 15.2 ± 10.1 degrees, $P = 0.0001$; left 11.0 ± 8.5 vs 15.2 ± 10.4 degrees, $P = 0.0013$), and a stepwise increase in the fall occurrence rate according to the level of dorsiflexion angle was evident in women (not significant in men). These results show that less ability to dorsiflex would partly explain the sex difference in the occurrence of falls and ensuing hip fracture.

The new dorsiflexion measure device we report here is easy and less time-consuming to use, and will be sure to help identify a high-risk group of fallers in the elderly.

Disclosure statement

This study was approved by the Ethics Committee of Kyorin University School of Medicine. Accordingly, written informed consent was obtained from all patients. All authors contributed significantly to this work and are

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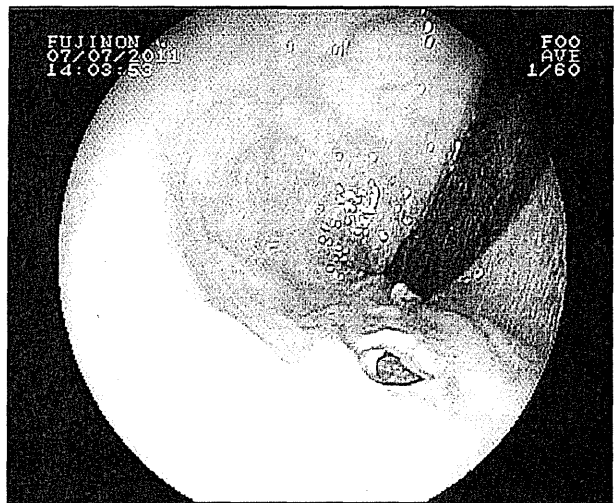
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Rectal perforation as a result of self-administration of retrograde enema in an elderly dementia patient

Retrograde cleansing enemas are commonly used in the treatment of chronic constipation, especially in the elderly.¹ We report a case of colorectal perforation as a result of self-administered retrograde water enema in an elderly dementia patient.

A 76-year-old chronically constipated man was admitted to Turkiye Yuksek Ihtisas Hospital Gastroenterology Department in Ankara, Turkey, with a 1-week history of rectal pain. His medical history showed he had the diagnosis of dementia. Clinical examination at that time showed normal vital signs, on examination of the abdomen there was no defense or rebound, digital examination was normal, and respiratory and circulatory system examinations were normal. All laboratory investigations including full blood count, serum amylase, liver function tests, urea and electrolytes were within normal limits. There was no abnormality in abdominal X-ray and abdominal ultrasonography. He was started on a retrograde enema by his family practitioner 7 days earlier for constipation. He described that the pain was precipitated by the first self-administration of the retrograde irrigation enema and the patient denied subsequent use. A preplanned colonoscopy was carried out, and on retroflexion a rectal perforation was detected (Fig. 1). An abdominal computed tomography scan showed perirectal air. Conservative management with intestinal rest and intravenous antibiotics was carried out. The clinical course of the patient was favorable without sepsis or generalized peritonitis. He was discharged home after a 7-day inpatient stay.

Perforation of the rectum and sigmoid colon caused by cleansing enemas, used by chronically constipated patients, has rarely been reported. In the largest series, Paran *et al.* reported that three of 13 patients with rectal perforation as a result of retrograde enema died because of late diagnosis.² Gayer *et al.* reported 14 elderly patients (average age 80 years) with rectal perforation as



a result of cleansing enema. Surgery was carried out in 10 of 14 patients, and nine of the 14 patients died. Interestingly, in all of these cases the enema was given by paramedic personnel.³ It is perhaps not so well known that the rectal wall, even in the absence of disease, can be perforated by the tip of a rubber catheter introduced for the purpose of administering a simple cleansing enema.⁴ Because of the possible risk of morbidity and mortality, especially in elderly patients in whom the process can be more catastrophic, rectal perforation risk should be kept in mind and administration of rectal cleansing enemas should be carried out gently and carefully by paramedic personnel. Also, the position of the body when inserting the enema tip is important. An enema should be carried out, in principle, with the patient in the left lateral decubitus position.⁵

RELATIONSHIP BETWEEN TESTOSTERONE AND COGNITIVE FUNCTION IN ELDERLY MEN WITH DEMENTIA

To the Editor: A decrease in sex hormones with aging has been reported to be related to psychosomatic disorders such as late-onset hypogonadism syndrome, frailty, and cognitive impairment in adult men.¹ For example, a community-based cross-sectional study has shown that elderly men with a lower blood concentration of bioavailable testosterone have more-severe impairment of cognitive function.² Moreover, a longitudinal study indicated that serum free testosterone (FT) concentration could predict memory performance and cognitive status in elderly men,³ but it is unknown whether lower testosterone concentration is related to cognitive impairment in individuals with dementia, because the previous studies primarily focused on a healthy community-based population. Also, few studies have addressed the relationship between testosterone and cognitive function in elderly Japanese men.

One recent cross-sectional study showed that total testosterone and FT concentration were associated with activities of daily living (ADLs) in institutionalized elderly men.⁴ This study also revealed that a relationship between testosterone and cognitive function could be found even in institutionalized elderly men with physical or neuropsychiatric dysfunction. Thus, whether lower testosterone concentration is related to deterioration of ADL in elderly men with cognitive impairment was longitudinally investigated.

Fifty-two male outpatients attending the Center for Comprehensive Care on Memory Disorders at Kyorin University Hospital were recruited (mean age 77.0 ± 5.5 , range 65–87). Participants' clinical backgrounds were hypertension, 48.9%; diabetes mellitus, 12.2%; and dyslipidemia, 38.1%. None had a history of stroke. Comprehensive geriatric assessment was performed based on basic ADLs (Barthel Index),⁵ instrumental ADLs (Lawton and Brody IADLs, 0–5 points in men),⁶ cognitive function (Mini-Mental State Examination (MMSE)),⁷ mood (Geriatric Depression Scale (GDS), 15 items),⁸ and vitality (Vitality Index, 10-point scale).⁹ This assessment was repeated 1, 2, and 3 years after baseline assessment at the first visit to the clinic. At the first visit, blood was drawn after an overnight fast and FT concentration was measured using radioimmunoassay. FT values ranged from 1.0 to 53.0 pmol/L (mean \pm SD 30.4 ± 11.0 pmol/L). Participants were classified into three groups according to tertile according to the baseline FT value (Figure 1), and the parameters from the comprehensive geriatric assessment were compared between groups and visits. Statistical data were analyzed using SPSS version 17.0 (SPSS, Inc., Chicago, IL). One-way analysis of variance (ANOVA) was applied for comparisons between groups, and the Fisher post hoc test was applied when significant ($P < .05$). One-way repeated ANOVA was used for comparisons between baseline and the 1-, 2-, and 3-year visits, and the Fisher post hoc test was applied when significant ($P < .05$).

There were no significant differences between groups in age (high, 75.3; middle, 76.6; low, 79.0), basic ADLs (high, 96.9; middle, 99.1; low, 95.3 points), MMSE (high, 23.2; middle, 25.1; low, 23.1 points), GDS-15 (high, 5.1; middle,

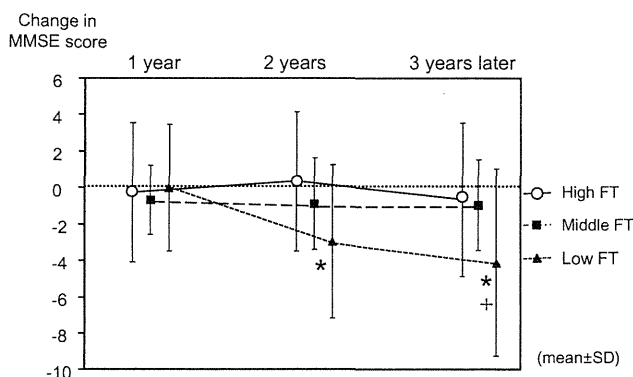


Figure 1. Change in Mini-Mental State Examination (MMSE) score according to tertile of serum free testosterone (FT) level in men. FT tertile: high, >36.1 pmol/L, $n = 17$; middle, 29.1 – 35.4 pmol/L, $n = 17$; low, <28.8 pmol/L, $n = 18$. * $P < 0.05$ vs highest FT group, + $P < 0.05$ vs middle FT group.

4.1; low, 4.6 points), and Vitality Index (high, 9.1; middle, 9.1; low, 8.8 points) at baseline, whereas IADLs tended to be lower (high, 4.1; middle, 4.1; low, 3.4 points, $P = .06$) in the low FT tertile group than in the other groups.

At the 1-year visit, there was no difference in change in MMSE score from baseline between the groups, although the decrease in MMSE score was larger in the low FT tertile group than in the middle and high tertile groups at the 2- and 3-year visits (Figure 1). Also, MMSE scores were lower in the low FT tertile group at the 2- ($P = .009$) and 3-year ($P < 0.001$) visits than at baseline, whereas they were not lower in the middle and high tertile groups. In contrast, there was no such trend in basic ADLs, IADLs, GDS scores, and Vitality Index.

Multiple regression analysis was performed with a decrease in MMSE score as a dependent variable and age; ADLs; body mass index; presence of hypertension, diabetes mellitus, or hyperlipidemia; and FT concentration as independent variables to consider factors affecting cognitive impairment, according to a previous report.⁴ Blood FT concentration was found to be an independent predictor of decrease in MMSE score at the 3-year visit ($\beta = 0.492$, $P = .02$).

A number of investigations support the biological plausibility of a protective effect of testosterone against cognitive dysfunction. The present findings from memory clinic outpatients are consistent with previous findings observed in elderly community-based men, showing a relationship between FT concentration and cognitive performance.³ Furthermore, the present findings indicate that a lower FT concentration could lead to a faster decline in cognitive function in elderly Japanese men who already show cognitive impairment. This study provides fundamental data for the future study of hormone replacement therapy for cognitive decline in elderly adults with low FT.

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BASELINE INSTRUMENTAL ACTIVITIES OF DAILY LIVING AND INCIDENT DEMENTIA

To the Editor: Sikkes et al.¹ have written an important paper showing that individuals without dementia with impairment in at least one of nine instrumental activities of daily living (IADLs) at baseline had a significantly higher incidence of dementia at 12 months (24.4%) than individuals without IADL impairment at baseline (16.7%) ($P = .04$). Their 531 participants who were followed for 12 months were relatively young (mean age 69.6), so it was decided to duplicate their study from prospective data from the Wyong Hospital Memory Clinic, 100 km north of Sydney. From 415 individu-

als attending a memory clinic, community-dwelling individuals aged 60 and older who were free of dementia at baseline and had a Mini-Mental State Examination score (MMSE²) of 25 to 30 and a follow-up MMSE and Montreal Cognitive Assessment (MoCA), range 0 (worst) to 30 (best)³ at 12 months were selected in a consensus conference of a geriatrician (PJ) and a clinical nurse consultant (EH). Each individual's family rated IADLs on the Nottingham scale,⁴ which ranged from 0 (worst) to 22 (best). Twenty-two of 82 (27%) converted to dementia at 12 months, compared with Sikkes conversion rate of 20.8% at 24 months—the most likely reason for this difference was that mean age (79.1) was 9.5 years older than theirs (69.6). Stats Direct Version 2.7.8b (StatsDirect Ltd, Altrincham, UK) from November 2011 was used to compare converters and nonconverters. Mean age of the 22 converters at baseline was significantly higher than that of the 60 nonconverters (82.0 ± 5.8 vs 78.0 ± 6.8 , $P < .01$), mean IADL score at baseline was significantly lower (13.1 ± 5.3 vs 16.1 ± 4.0 , $P = .0236$), MMSE score at baseline was by definition lower (25.6 ± 0.73 vs 27.5 ± 1.50 , $P < .001$), and MoCA score at baseline was lower (19.2 ± 3.5 vs 22.8 ± 3.9 , $P < .001$). At 12 months, IADL (11.4 ± 5.6 vs 15.4 ± 4.5 , $P = .004$), MMSE score (21.6 ± 4.5 vs 27.4 ± 1.6 , $P < .001$), MoCA (16.8 ± 3.6 vs 22.8 ± 4.2 , $P < .001$) remained significantly lower in converters.

The Nottingham IADL covers seven of the nine IADL items that Sikkes used, excluding medications and finances. Women are more likely than men to perform five of the Nottingham IADL items unless the men live alone with no home care services: cleaning the kitchen, making a hot snack, washing small items of clothing, doing a full clothes wash, and doing housework.

Although the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, criteria for dementia include a decline in social and occupational function, there is a surprising lack of research into IADLs as a predictor of incident dementia. This is an important topic for future research and ongoing studies are being conducted in three cohorts: Wyong Memory Clinic; general medical inpatients with delirium or subsyndromal delirium—a prospective randomized controlled trial, Central Coast Australia Delirium Intervention Study; and PhD study, PR DEFEAT DELIRIUM, in outpatients at high risk for incident delirium. One study⁵ with 255 community-dwelling individuals attending a memory clinic who were followed an average of 13 months has been published. The 11.4% of participants with antithyroid antibodies had similar outcomes at 12 months with respect to IADLs, decline in IADLs, MMSE and MoCA scores, and transfer to residential care.

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高齢者の在宅療養継続の関連要因の検討 —病院で在宅支援を受けた後の復帰困難要因の症例対照研究—

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A Case-Control Study of Factors Associated with Intermittent Home Care among Elderly Inpatients in Home Care Wards: Hiroko Ohshima^{*1}, Mitsuyo Ozaki^{*2}, Akemi Matsumoto^{*2}, Atsuko Ihata^{*2}, Kumi Nakamura^{*3}, Atsushi Harada^{*4} and Takao Suzuki^{*1,5} (^{*1}Center for Gerontology & Social Science, Section for Nursing & Care, ^{*2}Minami-3 Ward, ^{*3}Naka-5 Ward, ^{*4}Orthopedic Surgery, and ^{*5}Research Institute, National Center for Geriatrics and Gerontology)

Summary

We present a case-control study that was conducted to examine the factors associated with intermittent home care on elderly inpatients in home care wards. The results showed that the proportion of intermittent home care was approximately 20%, and the risks for intermittent home care were strongly associated with a lack of intention for continued home care for the elderly, lack of experience of home care, refusal of the family caregiver, and protracted length of stay. Key words: Elderly, Intermittent home care, Hospital

要旨 本研究は、在宅医療を支援する病棟において高齢者の在宅復帰困難の関連要因を検討することを目的に、在宅復帰困難例を症例、在宅復帰例を対照とした症例対照研究を行った。本邦の入院患者における在宅復帰困難高齢者は約20%であった。在宅復帰困難要因には、家族の介護受け入れ困難、本人の在宅療養への希望がないこと、在宅療養経験があること、在院日数の長期化が関連することが示唆された。

I. 背景

当センターの在宅支援の取り組みとして、近隣診療所医師の訪問診療を受けている、在宅療養継続を希望する患者を登録し、在宅復帰を支援する病棟（以下A病棟）が2009年4月に開棟された。開棟後、在宅復帰困難高齢者が急増したため、それら関連要因の検討が必要と考えた。

II. 目的

本研究は、高齢患者における在宅療養継続の関連要因を明らかにするために、入院し在宅支援を受けた後、在宅復帰困難の関連要因を検討することを目的とした。患

者の自宅以外の退院を在宅復帰困難とした。

III. 方法

1. 研究デザイン: 症例対照研究

1) 対象: 2009年4月1日～2011年12月末までにA病棟に入院した、65歳以上、生存退院した患者252名中、在宅復帰困難患者の症例44名(18%)、在宅復帰患者を対照とし、症例1名に対し対照2名の性別、年齢(±3歳)、疾患(癌・非癌)をマッチさせた計132名とした。

2) 調査項目: 属性(性別、年齢、主疾患)、医療処置・介護指導、在院日数、在宅復帰困難(退院先、理由など)、介護状況、多職種協働、在宅サービス利用状況などであった。

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表1 症例の退院先

	n=44 (%)
病院	28 (63.6)
老人保健施設	9 (20.5)
特別養護老人ホーム	2 (4.5)
他	5 (11.4)

表3 在宅復帰困難の関連要因
多重ロジスティック回帰分析の結果

	OR	95% CI	p value
高齢者の在宅療養希望の有無: 無	6.7	2.2~20.0	0.001
高齢者の在宅療養経験の有無: 有	16.4	1.4~187.0	0.024
在院日数 (日): 1日↑	1.2	1.0~1.5	0.044
家族の介護受け入れ困難の有無: 有	6.1	1.8~21.0	0.004

2. 分析方法

2群比較, 多重ロジスティック分析を行い, オッズ比 (odds ratio: OR) と95%信頼区間 (95% confidential intervals: 95% CI) を算出した。

3. 倫理的配慮

本研究は, 当センター研究倫理・利益相反審査委員会の承認を得た。得られた情報は個人が特定されないようにすべてデータ化し統計処理した。

IV. 結果

対象は, 男性61%, 平均年齢82.3 (標準偏差8.1) 歳, 癌16%, 予約入院53%であった。

1. 在宅復帰困難

症例の退院先を表1, 在宅復帰困難理由を表2に示す。症例は, 在宅療養経験有, 在宅療養の希望無, 家族の介護受け入れ困難の割合が有意に多く, 在院日数が有意に長かった。

2. 在宅復帰困難の関連要因

多重ロジスティック回帰分析の結果, 高齢者の在宅療養希望なし, 高齢者の在宅療養経験あり, 在院日数の長

表2 在宅復帰困難の主な理由

理由	n=44
高齢者	39
在宅療養を希望しない	18
専門的治療が必要	16
入院後の状態悪化	10
家族・介護者	26
介護の受け入れ困難*	15
介護力不足*	11
他	3

複数回答, *:看護師評価

期化, 家族の介護受け入れ困難が在宅復帰のリスクとして抽出された (表3)。

V. 考察

本邦における高齢者の在宅復帰困難割合は, 18%と1~2年目よりさらに増加していた。それらの要因に, 高齢者の在宅療養継続の希望がないこと, 在宅療養の経験があることが明らかになり, 従来報告されている属性, 生活機能, 医療処置などが在宅復帰困難のリスクではないことが示唆された。また, 在院日数の延長そのものが在宅復帰困難のリスクであることが示唆された。本研究から在宅復帰困難リスクの新しい知見が得られた。

VI. 結論

在宅療養を支援する病棟の入院患者における在宅復帰困難高齢者は約20%であった。在宅復帰困難要因に, 高齢者の在宅療養希望なしと, 在宅療養経験があり, 家族の介護受け入れ困難, 在院日数の長期化が関連することが示唆された。

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本論文の要旨は第23回日本在宅医療学会学術集会において発表した。

できれば最期まで
在宅で生活を！

在宅ケアの先進的取り組み —先進的取り組みの 概観と展望—

おおしまひろこ
大島浩子



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はじめに

在宅医療は患者・家族の生活の場で医療を提供するもの¹⁾である。近年、病気や障害があっても最期まで自宅で過ごしたい、と思う人が増え、ますます在宅医療の普及と充実が望まれている²⁾。

2009年4月(独)国立長寿医療研究センター(以下、当センター)に在宅医療支援のモデル病棟として、在宅医療支援病棟(以下、当病棟)が開棟された。当病棟は近隣地域に向けた在宅支援を行っている。ここでは、当病棟の概要と入院患者の概要と病棟看護師の取り組みの一部を紹介する。

独立行政法人国立長寿医療研究センターにおける取り組み

当病棟は、①当センター近隣の診療所医師を登録し(以

下、登録医)、登録医の訪問診療を受けて在宅療養を希望する患者を登録(以下、登録患者)し、②登録医の判断による登録患者の入院を支援する。登録や入院依頼の調整は地域医療連携室が窓口となり、当病棟と連携している。入院後は、③救急から看取りケアまで対応し、「在宅復帰支援：当センター入院中の未登録患者が在宅療養へ移行するための支援」と「在宅継続支援：在宅療養中の登録患者が入院し、当病棟退院後も在宅療養を継続するための支援」の2つの方向性で、④多職種連携・協働を目指し、近隣地域の在宅医療・ケア提供者と当センター内職員との連携による在宅支援に取り組んでいる(図1)。

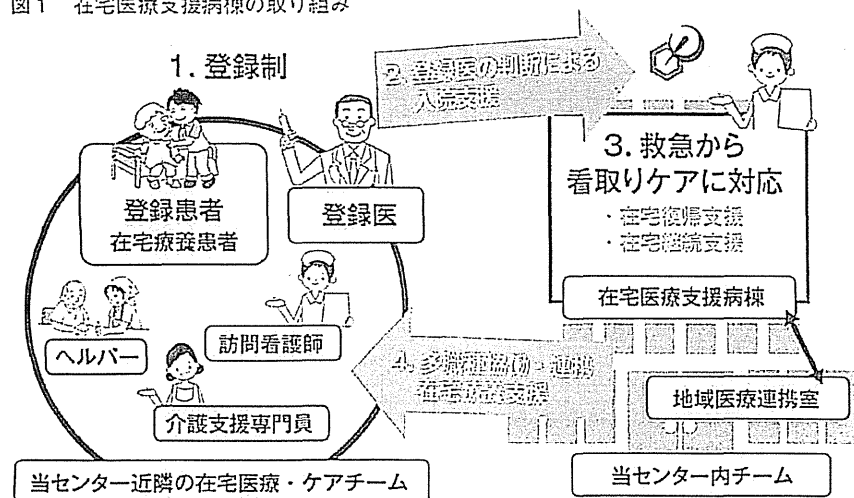
在宅医療支援病棟入院患者の概要と在宅支援

1. 患者概要

開棟1年目の初回入院患者の検討から、患者はがんと神経難病が多く、約3割が要介護度5と生活機能は低く、半数に何らかの在宅での医療処置を必要としている。入院目的は在宅療養指導・調整よりも治療・検査が多く、胃腸交換や家族のレスパイト等である。

在宅継続支援を受ける高齢患者167名のうち75%は、入院時に、肺炎、尿路感染、誤嚥・嚥下障害、褥瘡などの老年症候群³⁾、食不振、がん末期症状などさまざまな症状を有している。開

図1 在宅医療支援病棟の取り組み



棟当初と3年目では、患者の平均在院日数は14日が19日と延び、また、在宅復帰率は98%が87%と低下し、当病棟で支援を受けた直後でも在宅療養の継続がむずかしくなっている。

2. 在宅支援内容

家族・介護者への在宅療養指導は、自宅で行う吸引や酸素管理、胃瘻、経鼻胃管等の食事、身体介護、褥瘡処置、褥瘡や転倒の予防方法、在宅サービスの調整、「最期をどこで過ごすか？」等の意思決定支援を行う。非がん患者よりがん患者に対して看取り指導を行う機会が多い⁴⁾。

3. 復帰と継続支援

在宅復帰支援は、急性期治療終了後初めての在宅療養に向けた在宅サービスの調整と在宅医療の指導などである。在宅継続支援は、在宅療養中の症状悪化や急性増悪の治療・検査や緊急時対応、老年症候群などへの対応、在宅サービスの調整、また、状態に変化がなく在宅療養の指導や調整の必要性がない登録患者についても入院による在宅移行支援を行っている。

4. 多職種協働・連携

病棟看護師が退院時共同指導・カンファランス（以下、カンファ）の必要性を判断し、退院予定の高齢患者については約4割にカンファや患者宅訪問を行っている。カンファの参加者は家族・介護者、介護支援専門員、訪問看護師であるが、高齢患者自身の参加は1割と少ない（図2）。

5. 入院前訪問

入院前訪問とは、「初めて入院する患者の在宅療養環境や介護状況等を把握するために、病棟看護師が入院前に患者宅を訪問する」当病棟独自の取り組みである。病棟看護師は、当病棟独自の「入院前訪問用記録用紙（図3）」を用いて、事前の情報確認、患者の自宅での療養状況や環境、患者・家族の希望などの情報を収集しながら、入院目

的を確認し、入院中と退院後の状態について患者・家族と共有する。訪問後から入院までに患者の看護計画を立案する。初回入院164名のうち入院前訪問を受けた患者の在院日数は受けない患者より短かった。

病棟看護師が患者の療養生活の場に出向くこと、また、その際に入院前から退院時の在宅療養生活を見通すことに意義のある取り組みである。これは、在宅療養支援の重要な視点である。

今後の展望

当センターの取り組みから、病院から地域・在宅に向けた在宅支援が普及することが期待される。そのためには、データを基に、症状管理やレスパイトケアなどの長期的支援方法、在宅復帰困難の要因、多職種協働の評価などを検討し、具体的な在宅支援モデルを示すことが喫緊の課題である。

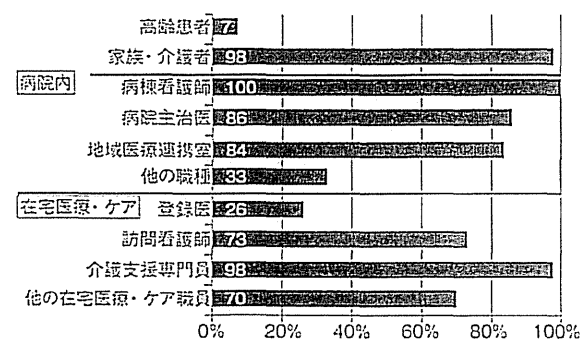
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図3 (独) 国立長寿医療研究センター在宅医療支援病棟 入院前訪問記録様式(病棟看護師により作成)

入院前訪問		平成21年3月18日
患者氏名	性() 年() 月() 日() 男・女 ID()	
入院予定期間	年 月 日～ 年 月 日	
1.日時	年 月 日() : ~ :	
2.場所	患者自宅	
3.目的	登録患者の在宅療養の様子を把握し、観察医後・継続看護へ後立てる	
4.参加者	病棟スタッフ その他	
5.内容		
1) 自己紹介		
2) 事前情報(情報提供書・看護サマリーなど)からの不足情報を確認 病歴と入院に至るまでの経過、入院目的の理解、医療処置内容、看護ケアの実現、身体状況、入院中の留意点、家族の状況、社会資源の利用状況と今後の対策、入院当日の搬送方法など		
3) 患者・家族の入院に対する気持ちや疑問		
4) 入院の日時・時間、入院に必要な書類の確認		
退院時の目標、入院中の看護計画(プロブレムリスト)、入院時に必要なDr指示		

図2 退院前カンファランス参加者とその割合



生存で自宅退院した高齢者延136名

N=136

