Association Between Diabetes and Stroke Subtype on Survival and Functional Outcome 3 Months After Stroke
Data From the European BIOMED Stroke Project

Salah-Eddine Megherbi, MD; Chantal Milan, PhD; Dominique Minier, MD; Grégory Couvreur, MD; Guy-Victor Osseby, MD; Kate Tilling, PhD; Antonio Di Carlo, MD; Domenico Inzitari, MD; Charles D.A. Wolfe, MD; Thibault Moreau, MD; Maurice Giroud, MD; for the European BIOMED Study of Stroke Care Group

Background and Purpose—Although diabetes is a strong risk factor for stroke, it is still unclear whether stroke subtype, severity, and prognosis are different in diabetic and nondiabetic patients. We sought to evaluate stroke features, prognosis, and functional outcome in patients with diabetes compared with patients without diabetes.

Methods—In a European Union Concerted Action involving 7 countries and 4537 patients hospitalized for a first-in-a-lifetime stroke, defined according to the Oxfordshire Community Stroke Project criteria, we collected data on demographics, risk factors, clinical presentation, and outcome. We used logistic regression to examine the relationship between diabetes and outcome at 3 months (disability, handicap, and death), controlling for risk factors, clinical presentation, and demographics.

Results—Overall, diabetes was present in 937 patients (21%). Diabetic patients, compared with those without diabetes, were more likely to have limb weakness (P<0.02), dysarthria (P<0.001), ischemic stroke (P<0.001), and lacunar cerebral infarction (P=0.03). At 3 months, the case fatality rates were not higher in the diabetic groups (P=0.33). Handicap (Rankin Scale) and disability (Barthel Index) were significantly higher in diabetic patients (P=0.005 and P=0.016, respectively).

Conclusions—Stroke in diabetic patients has a specific clinical pattern and a poor prognosis in terms of motor function, which emphasizes the need for early diagnosis and treatment of every case of diabetes. (Stroke. 2003;34:688-694.)

Key Words: cerebrovascular disorders ■ diabetes mellitus ■ stroke ■ stroke management ■ stroke outcome ■ stroke prevention

Diabetes mellitus is a well-established independent risk factor for stroke and is associated with high mortality.1-3 This increased risk has been linked to the pathophysiological changes seen in the cerebral vessels of patients with diabetes.4 The aim of the present study was to prospectively characterize stroke patterns in diabetic and nondiabetic stroke patients and to estimate recovery and prognosis in a large European sample of hospitalized stroke patients.6

Subjects and Methods

Inclusion Criteria
The European BIOMED I study included 12 centers (22 hospitals) in 7 European countries: England, France, Germany, Hungary, Italy, Portugal, and Spain.6 The ethics committees of participating centers approved the study. Patient-based data collection began in the majority of hospitals in September 1993 and involved all first-in-a-lifetime stroke patients hospitalized in the subsequent year. Stroke was defined according to the World Health Organization (WHO)5 with brain imaging confirmation. The variables identified for the questionnaires were similar to those that have been used in the MONICA (Monitoring Trends and Determinants in Cardiovascular Disease) Stroke Study6 and in population registers.1,9 Each stroke patient was investigated in a standardized manner. The assessments were comparable between hospitals. Patients were evaluated in the acute phase and 3 months after stroke. A complete description of all study variables has been given in detail elsewhere.6

Diagnosis of Diabetes
Patients were divided into 2 groups according to patient recall or medical records: (1) patients with no past history of diabetes and (2) patients with known diabetes, treated with either insulin therapy or oral hypoglycemic therapy or not treated, whatever the plasma glucose level at stroke onset. Patients with repeated fasting plasma glucose level performed in all centers >7.8 mmol/L (140 mg/dL)
were enrolled in accordance with the WHO diagnostic criteria for diabetes used in 1993.

**Clinical Assessment**

**Baseline Characteristics**
Baselne characteristics included age, sex, living conditions, medication before stroke (antihypertensive, antplatelet, and anticoagulant therapy), and prestroke level of handicap, as defined by the modified Rankin Scale.

**Vascular Risk Factors and Comorbid Conditions**
Vascular risk factors and comorbidity conditions included hypertension (previous diagnosis, current treatment, or values > 160/95 mm Hg); atrial fibrillation (history of chronic atrial fibrillation, confirmed by at least 1 ECG, or presence of the arrhythmia during hospitalization); previous myocardial infarction; transient ischemic attack (TIA) (acute neurological deficit of vascular origin, lasting < 24 hours); smoking (current or former habit); and alcohol consumption.

**Clinical State at Time of Maximum Impairment Within the First 7 Days**
Clinical state was assessed by level of consciousness (subsequently divided into 2 categories of coma or noncoma); confusion during the first week after stroke; presence of limb weakness (slight motor deficit) or paralysis (heavy motor deficit); speech or swallowing problems as a result of stroke; and urinary incontinence.

**Use of Major Diagnostic Tests or Therapeutic Interventions**
Major diagnostic tests included brain imaging, angiography, Doppler sonography, and echocardiography; therapeutic interventions included neurosurgery, carotid surgery, and other vascular surgery.

**Pathological Subtypes of Stroke**
Pathological subtypes of stroke were defined as cerebral infarction, cerebral hemorrhage, subarachnoid hemorrhage, or unclassified stroke according to the results of brain imaging. Clinical subtypes of ischemic stroke were rated according to the Oxfordshire Community Stroke Project criteria as total anterior circulation infarct (TACI), partial anterior circulation infarct (PACI), posterior circulation infarct (POCI), and lacunar infarct (LACI).

**Outcome Data 3 Months After Stroke Onset**
Outcome data included information on vital status, handicap (Rankin Scale), and disability (Barthel Index). The assessment was usually made through a direct or proxy face-to-face interview, except at 1 UK center, where follow-up was made by a previously validated postal questionnaire. In case of death, date and cause were registered by gathering the information from relatives or general practitioners.

**Statistical Analysis**
The relationships between baseline and clinical variables and diabetes were analyzed with the $\chi^2$ test and $t$ test for categorical and continuous variables, respectively.

Disability at 3 months was defined as a Barthel Index score of $\leq 14$. Handicap at 3 months was defined as a Rankin Scale score of $\geq 2$. The relationships between diabetes and survival status, disability, and handicap at 3 months were examined by logistic regression after adjustments for each country. A multivariable model for each outcome was then selected with the use of backward stepwise logistic regression to identify the baseline and clinical variables most strongly related to each outcome. Because the variability between the countries was larger than that between the centers, we adjusted the multivariate models to the countries and not to the centers to reduce the number of parameters of the model.

All probability values quoted were 2-tailed. Data were analyzed with BMDP statistical software.

### Results

**Clinical Characteristics**
During the 12-month period, a total of 4537 consecutive patients with acute stroke were included in the study, and 4481 (50.1% female; mean age, 71.7 ± 12.6 years; range, 13 to 102 years; 1347 aged ≥ 80 years) had complete data. Reliable information about diabetes could not be obtained in 56 patients (1.2%); they had severe strokes and were unconscious on admission and died before we could establish whether they had diabetes. Compared with the rest of the patients, they were significantly older (mean age, 80.5 years [SD 6.8] versus 76.8 years [SD 11.2]; $P < 0.005$). The sex ratio was similar.

Diabetes was identified in 937 (21%) of the patients (51% female). Clinical characteristics of the cohort are reported in Table 1. Diabetic patients had a mean age and sex distribution similar to those of nondiabetic patients. Diabetic patients reported a significantly lower alcohol intake but no difference in smoking habits. The prestroke institutionalization rate did
not differ between the 2 groups. Diabetic patients reported a
distribution of prestroke TIA similar to that of nondiabetic
patients. Diabetic patients more frequently had a history of
hypertension (P < 0.001), used antihypertensive therapy
(P < 0.001), and showed a higher prestroke level of handicap,
as defined by the Rankin Scale (P = 0.014). However, atrial
fibrillation was less frequent in the diabetic group (P = 0.012).
No details on the treatment of diabetes were available.

When we analyzed the single variables separately for each
country, the major findings of the present study were essen-
tially confirmed.

**Stroke Characteristics and Use of Diagnostic and Surgical Procedures**

Table 1 reports stroke characteristics and in-hospital use of
diagnostic resources and surgical procedures. There was a
significant difference between the diabetic and nondiabetic
groups in motor deficits. There was an increased proportion
with limb weakness in the diabetic group (42.3% versus
37.6%; P = 0.02). Dysarthria was more frequent in the dia-
betic group (37.7% versus 30.3%; P < 0.001), although apha-
sia was less frequent (28.3% versus 32.4%; P = 0.014).
Swallowing problems were less frequently present in the
diabetic group (22.1% versus 27.0%; P = 0.002). There was
no difference between the 2 groups in the frequency of
urinary incontinence and loss of consciousness. The use of
diagnostic investigation was similar except for angiography,
which was less frequent in diabetics. Neurosurgery was also
less common in the diabetic group.

A comparison of the distribution of pathological types of
stroke showed a significant difference between patients with
and without diabetes (P < 0.001) (Table 2). The diabetic
patients were more likely to have an ischemic stroke (77.5% versus
71.9%) and less likely to have a hemorrhagic stroke than
nondiabetic patients (8.5% versus 11.5%). There was a
difference (P = 0.031) in the distribution of ischemic stroke
subtypes11: there were more POCI and LACI syndromes in
the diabetic group and more TACI and PACI syndromes in
the nondiabetic group.

**Stroke Recovery and Outcome**

Follow-up information was completed for 3558 patients (79% of
the total study sample; 78% in the diabetic group and
79.6% in the nondiabetic group). At 3 months, the case
fatality rates in the 2 groups were comparable (20.2% versus
21.8%; P = 0.318). Among survivors, handicap was signifi-
cantly increased in patients with diabetes according to Rankin
Scale score between 2 and 5 (73.3% versus 66.9%; P = 0.007), but no significant difference was found in the
disability according to Barthel Index score of <14 (28.2% versus
25.3%; P = 0.20).

**Death at 3 Months**

Table 3 reports the factors associated with 3-month death as
determined by multivariable analysis in the whole group and
in the 2 groups separately. When all study patients were
considered (diabetics and nondiabetes), diabetes was not
related to 3-month death (odds ratio, 1.21; 95% CI, 0.93 to
1.57; P = 0.33). The following factors were significantly
related to death: male sex, age (mainly ≥85 years), prestroke
Rankin Scale score 2 to 5, coma, urinary incontinence,
swallowing problems, and hemorrhagic stroke. When the 2
groups were examined separately (Table 3), we observed that
diabetic men had a higher risk for death at 3 months and that
coma was a stronger factor of death at 3 months in the
nondiabetic group.

**Disability (Barthel Index) at 3 Months**

The analysis of the association between diabetes and disabil-
dity, defined by the Barthel Index (scored from 0 to 14), is
presented in Table 4.

Diabetics were more disabled at 3 months than nondiabet-
ics (odds ratio, 1.39; 95% CI, 1.05 to 1.83; P = 0.016). Female
sex, old age, prestroke Rankin Scale score 2 to 5, confusion,
swallowing problems, and urinary incontinence were signif-
icantly related to disability in total sample. In diabetic
patients, only age, prestroke Rankin Scale score 2 to 5, and
urinary incontinence were significantly associated with
disability.

**Handicap (Rankin Scale) at 3 Months**

The analysis of factors related to 3-month handicap, defined
as Rankin Scale score 2 to 5, is shown in Table 5. Diabetes
was significantly related to handicap (odds ratio, 1.47; 95% CI,
1.13 to 1.91; P = 0.005). Female sex, prestroke Rankin Scale
score 2 to 5, living in an institution, myocardial
infarction, atrial fibrillation, coma, aphasia, urinary inconti-
nence, and swallowing problems were risk factors of handi-
cap at 3 months. When the 2 groups were considered
separately, in the diabetic group, female sex, prestroke
Rankin Scale score 2 to 5, coma, and urinary incontinence
were related to handicap at 3 months.

**Discussion**

The main purpose of this study was to evaluate the impact of
diabetes on initial stroke type patterns and outcome in a large
sample of stroke patients hospitalized in a European context.
TABLE 3. Association Between Baseline and Clinical Variables and 3-Month Death (From Multivariate Logistic Regression Models)∗

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (n=3084)</th>
<th>Yes (n=654)</th>
<th>No (n=2430)</th>
</tr>
</thead>
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<tr>
<td>Female</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Male</td>
<td>1.50 [1.21–1.86]</td>
<td>2.20 [1.35–3.57]</td>
<td>1.33 [1.04–1.70]</td>
</tr>
<tr>
<td>Age ≤64</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Age 65–74</td>
<td>1.93 [1.36–2.75]</td>
<td>1.59 [0.75–3.37]</td>
<td>2.04 [1.36–3.06]</td>
</tr>
<tr>
<td>Prestroke Rankin (0–1)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No hemorragic stroke</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hemorragic stroke</td>
<td>1.42 [1.11–1.83]</td>
<td>1.12 [0.63–1.98]</td>
<td>1.49 [1.13–1.97]</td>
</tr>
<tr>
<td>No coma</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No urinary incontinence</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Urinary incontinence</td>
<td>2.85 [2.24–3.63]</td>
<td>3.55 [2.10–6.01]</td>
<td>2.70 [2.05–3.54]</td>
</tr>
<tr>
<td>No swallowing problems</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Swallowing problems</td>
<td>2.36 [1.85–3.01]</td>
<td>2.70 [1.52–4.79]</td>
<td>2.35 [1.79–3.09]</td>
</tr>
<tr>
<td>No diabetes</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.21 [0.93–1.57]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Adjusted by country; **95% CI indicates 95% confidence interval.

Prestroke Clinical Characteristics

The prevalence of diabetes was 21%. In other studies, diabetes has been reported to be between 13% and 36%. This large variation was probably caused by differences in the selection of patients, in the size of the cohorts, and in the definition of diabetes and methods of measuring glycemia.

The present study showed that, as observed in other studies, diabetic patients with stroke are the same age as nondiabetic patients. This may be explained by the fact that atheroma of cerebral vessels induced by diabetes occurs at the same rate as other vascular risk factors. There was no difference between the 2 groups in the sex ratio, suggesting that diabetes has the same impact on cerebral vessels in both sexes. Current or previous smoking was distributed equally between the 2 groups, but alcohol consumption was low in the diabetic group, implying that diabetes may modify behavior.

Hypertension was more frequent in diabetic patients, and antihypertensive therapy was prescribed in a greater proportion of diabetic hypertensive patients than in nondiabetic patients, in accordance with previous observations. Emphasizing the fact that diabetes and hypertension are associated.

Antiplalet and anticoagulant therapies were prescribed equally in both groups. These data show that practitioners did not consider diabetic patients differently than nondiabetic patients in 1993. Today there are recommendations by several organizations stating clearly that antiplalet therapies and treatments of vascular risk factors should be used in diabetic patients. The characteristics of diabetic patients who did not receive such therapy were not different from those of nondiabetic patients, and if we compare data between centers, the proportion of patients treated with antiplalet drugs was similar in diabetic and nondiabetic groups.

Atrial fibrillation may be a cause of more severe handicap by way of motor and cognitive deficits and pseudobulbar syndrome induced by a higher risk of stroke. However, atrial fibrillation was less frequent in the diabetic group, as reported previously, suggesting that poststroke handicap in the diabetic group is due to another cause as well as microangiopathy induced by hypertension.

The proportion of previous TIA was similar in the 2 groups, suggesting that the effects of hypertension and atrial fibrillation are balanced equally in the 2 groups. There was no difference between the 2 groups in the percentage of institutionalized patients.

Clinical and Subtype Characteristics of Stroke

In diabetic patients, the neurological deficit was characterized by a predominance of motor deficit, especially weakness and dysarthria, but aphasia was more common in nondiabetic patients. Dysarthria may be interpreted as the consequence of bilateral small lesions affecting pyramidal corticonuclear tracts by means of lacunar lesions. These clinical features, similar to lacunar syndrome, were associated with more
The low frequency of hemorrhage in patients with diabetes is well known \(^4,5\) and may be a true phenomenon, ie, a real pathophysiological association may exist in which the treatment of hypertension is not the main explanation. \(^4,5\)

In our diabetic group, the distribution of the pathological subtypes of stroke\(^11\) was slightly different, with more POCI and LACI syndromes. The fact that we observed more LACI syndromes in diabetic patients has not been reported in other studies,\(^20,21\) which raises the problem of biases induced by small series, the definition of diabetes, and other methodological aspects.\(^4,21\)

### Death at 3 Months

Diabetes was not associated with death at 3 months, whereas male sex, old age, prestroke handicap, hemorrhage, coma, urinary incontinence, and swallowing problems were independently associated with death at 3 months. Our series does not identify diabetes as a determinant of early mortality (3 months), while in the literature, diabetes appears to be determinant of late mortality through coronary heart disease. We think that the increased presence of lacunes in diabetic patients may also explain the low mortality at 3 months.

### Disability and Handicap at 3 Months

Our results show the effect of diabetes on disability and handicap in stroke patients. There is evidence of an adverse relationship between diabetes and both handicap (Rankin Scale) and disability (Barthel Index) at 3 months, with stronger evidence of the relationship with handicap.

Factors that increase the risk of handicap, measured by the Rankin Scale, and the risk of disability, measured by the Barthel Index, are female sex, old age (particularly for those aged \( \geq 85 \) years), prestroke Rankin Scale score, dysphagia, and urinary incontinence. These factors have a similar value for the 2 scales. Confusion has a significant predictive value for a poor Barthel Index score, while coma, aphasia, atrial fibrillation, and myocardial infarction have a significant predictive value for a poor Rankin Scale score.

According to the results of the 2 groups, dysphagia is a stronger factor for handicap (Rankin Scale) than for disability (Barthel Index) in the diabetic group. The presence of atrial fibrillation or myocardial infarct is a weaker factor for handicap (Rankin Scale) in the diabetic group than in the nondiabetic group. However, coma and history of living in an institution are related to a poor Rankin Scale score in the diabetic group. These data also reflect the negative impact of multiple and repeated ischemic cerebral lesions.

Our data suggest that Barthel and Rankin scores are complementary, with the Barthel score identifying objective parameters of disability and the Rankin score identifying subjective parameters of disability and of global health index, with a strong accent on physical ability. As suggested by the Rankin Scale score at 3 months, diabetic patients recover more slowly than nondiabetic patients. This finding is supported by others.\(^4,13,21\) Various mechanisms may account for

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### Table 4. Association Between Baseline and Clinical Variables and Disability Defined as Barthel (0–14) at 3 Months (From Logistic Regression Models)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Diabetes</th>
<th>Diabetes</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR [95% CI]**</td>
<td>OR [95% CI]**</td>
<td>OR [95% CI]**</td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>1.35 [1.07–1.70]</td>
<td>1.18 [0.73–1.90]</td>
<td>1.37 [1.02–1.79]</td>
</tr>
<tr>
<td>Age 65–74</td>
<td>1.33 [0.96–1.85]</td>
<td>2.19 [1.15–4.18]</td>
<td>1.08 [0.73–1.59]</td>
</tr>
<tr>
<td>Age 75–84</td>
<td>1.81 [1.31–2.51]</td>
<td>1.32 [0.65–2.68]</td>
<td>1.95 [1.35–2.64]</td>
</tr>
<tr>
<td>Prestroke Rankin 0–1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Prestroke Rankin 2–5</td>
<td>2.54 [1.94–3.34]</td>
<td>2.19 [1.26–3.80]</td>
<td>2.63 [1.92–3.60]</td>
</tr>
<tr>
<td>No confusion</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Confusion</td>
<td>1.70 [1.28–2.26]</td>
<td>1.31 [0.71–2.44]</td>
<td>1.85 [1.33–2.55]</td>
</tr>
<tr>
<td>No swallowing problems</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Swallowing problems</td>
<td>2.04 [1.50–2.77]</td>
<td>1.26 [0.62–2.56]</td>
<td>2.26 [1.60–3.19]</td>
</tr>
<tr>
<td>No urinary incontinence</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No diabetes</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.39 [1.05–1.83]</td>
<td>1.08 [0.73–1.59]</td>
<td>1.95 [1.35–2.64]</td>
</tr>
</tbody>
</table>

*Adjusted by country; **95% CI indicates 95% confidence interval.
this, including more comorbidities, more prestroke disability, more ischemic lacunes, more motor problems, and diabetic neuropathy.

Conclusion

From this large prospective European multicenter study, stroke in diabetic patients was different from stroke in nondiabetic patients from several perspectives. In diabetic stroke patients, the frequency of intracerebral hemorrhage was lower, the rate of lacunes was higher, recovery of handicap by Rankin Scale score was worse, and mortality was not increased. Prevention and treatment of stroke in diabetic patients are major challenges facing those involved in health planning in Europe in the coming decades.

Appendix

Study Participants

Study participants include the following: O. Tofani, A. Rosselli, F. Cordopatri, G. Giuntoli, M. Magherini, P. Penatti, S. Tatini, F. Trucco, E. Pieragnoli, F. Manetti, C. Mugnaini, L. Bagnoli, O. Marrassa, G.P. Menegazzo, and I. Meucci, S.M. Ospedale, Annunziata, Health Area 10, Florence, Italy; C. Cappelletti, M. Ricca, P. Adriani, and C. Bianco, Nuovo Ospedale S. Giovanni di Dio, Health Area 10, Florence, Italy; R. Beech, K. Tilling, C.D.A. Wolfe, Department of Public Health Sciences, King’s College, London, England; A.G. Rudd, Department of Care of the Elderly, St Thomas’ Hospital, London, England; S. Ebrahim, Department of Social Medicine, Bristol University, Bristol, England; D.H. Barer and Y. Ellul, Department of Medicine for the Elderly, Newcastle General Hospital, Newcastle, England; M. Ayana, P. Gompertz, R. Harwood, and P. Pound, Department of Primary Care and Population Sciences, Royal Free Hospital School of Medicine, London, England; H. Rogers, Center for Health Service Research, University of Newcastle, Newcastle, England; M. Giroud, M. Menassa, and M. Lemesle, Service de Neurologie, Center Hospitalier Regional et Universitaire de Dijon, Dijon, France; K. Kunze, Neurologischen Universitatsklinik, Hambourg-Eppendorf, Germany; J. Berger, Institute of Mathematics and Computer Science in Medicine, University Hospital Eppendorf, Eppendorf, Germany; B. Haussler, W. Mall, and N. Nolting, Institut für Gesundheits- und Sozialforschung GmbH (IGES), Berlin, Germany; Z. Nagy, C. Ovary, and Z. Vokoq, National Stroke Center, Budapest, Hungary; M. Carrageta, J. Namora, I. Remidios, A. Santos, and J. Coisinha, Hospital Garcia de Orta, Almada, Portugal; J. Dias, Divisão de Epidemiologia, Direcção

<table>
<thead>
<tr>
<th>Table 5. Association Between Baseline and Clinical Variables and Handicap Defined as Rankin Score (2–5) at 3 Months (Logistic Regression Analysis)*</th>
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<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>≤64</td>
</tr>
<tr>
<td>65–74</td>
</tr>
<tr>
<td>75–84</td>
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<tr>
<td>≥85</td>
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<tr>
<td>Prestroke Rankin</td>
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<td>(0–1)</td>
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<tr>
<td>Living conditions alone</td>
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<tr>
<td>At home not alone</td>
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<tr>
<td>Institutionalized</td>
</tr>
<tr>
<td>No atrial fibrillation</td>
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<tr>
<td>Atrial fibrillation</td>
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<tr>
<td>No myocardial infarction</td>
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<td>Myocardial infarction</td>
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<tr>
<td>No coma</td>
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<td>No diabetes</td>
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<td>Diabetes</td>
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</table>

*Adjusted by country; **95% CI indicates confidence interval.
Acknowledgment

This study was supported by the European Union BIOMED I Program.

References

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