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Stroke prevention in Italy: the role of the family doctor

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Abstract

Stroke is the third leading cause of mortality and the first cause of disability in Italy, with an estimated incidence of non-fatal cases of stroke of 10 cases/1000 person years among hypertensive patients, and a prevalence of ischemic stroke in the year 2001 of 5.4/1000 persons. The main responsibility for the primary prevention of stroke should be with the primary care physicians as they are best positioned to determine an at-risk population and to initiate educational, lifestyle, and cardiovascular risk reduction treatments. In primary prevention, only well-documented and potentially modifiable risk factors should be tackled. Recognition of the most relevant modifiable risk-factors leads to corresponding interventions. However, data from surveys conducted in general practice clearly demonstrate an overall under-monitoring or under-treatment for the most relevant risk factors, such as high blood pressure, smoking status, high cholesterol level, atrial fibrillation, and left ventricular hypertrophy, which led to a corresponding low treatment prevalence among moderate and high-risk stroke patients. In this context, the use of automatic electronic reminders has shown promising results in improving the performances of primary care physicians in the primary prevention of high-risk cardiovascular patients. This suggests there is a need for further research in general practice to evaluate the effect of such a system in improving the prognosis of individuals at high-risk of stroke.

Key words: family practice, stroke, primary prevention, physician's practice patterns

Background

Stroke remains a major healthcare problem. In the US, the incidence of stroke is approximately 700,000 cases per year, resulting in 160,000 deaths annually, with 4.8 million stroke survivors alive today [1]. Stroke ranks as the western countries' third leading cause of death and it is also a leading cause of functional impairment [1]. Utility analyses has shown that a major stroke is viewed by more than half of those at risk as being worse than death [2]. Despite the advent of more effective treatments due to the widespread implementation of "Stroke Units" [3], prevention remains the best approach for reducing the burden of stroke; primary prevention being particularly important as 70% of stroke cases are seen as first events [1].

In Italy, data from the Health Search/Thales database, an electronic general practice database [4-6], indicates that in a population of hypertensive patients from 400 primary care physicians (PCPs), diagnosed between 2000 and 2005, the overall incidence of non-fatal cases of stroke is 10 cases/1000 person years. Data from another study conducted with 318 PCPs, using the same data source, reported for the year 2001 a prevalence of ischemic stroke of 5.4/1000 [4].

Data from other countries confirm an incidence of stroke of around 1-2% after myocardial infarction [7]. The occurrence of stroke seems to be inversely related to the cardiac ejection fraction [8], whereas peripheral arterial disease increases the risk of stroke by approximately 40% [9]. Case-control studies of stroke patients and prospective epidemiological studies have confirmed an independent effect of diabetes on ischemic stroke, with a 1.8 to an almost 6-fold increase in RR [10].

The main responsibility for the primary prevention of stroke should be with the PCPs, ideally with the integrated support of a cardiologist and diabetologist, as these health care providers are best positioned to determine an at-risk population and to initiate educational, lifestyle, and cardiovascular risk reduction treatments. In primary prevention, only well-documented and potentially modifiable risk factors should be tackled and priority should consider the risk-factor prevalence as well as the cost/effectiveness and risk/benefit ratio of the preventive interventions. The most important stroke risk factors commonly encountered in daily clinical practice, according to the American Heart Association [1], are reported in Table 1. It is therefore clear that in every-day practice there will be no difference between primary prevention

Table 1. Well-Documented and Potentially Modifiable Risk Factors (modified from ref. 7).

Factor	Prevalence %	Population attributable risk*	Risk Reduction with Treatment
Hypertension			38%
Age 50 years	20	40	
Age 60 years	30	35	
Age 70 years	40	30	
Age 80 years	55	20	
Age 90 years	60	0	
Cigarette smoking	25	12-18	50% after 1 year; baseline after 5 years
Diabetes mellitus	7.3	5-27	Reduction of stroke risk in hypertensive diabetic patients with blood pressure control. No demonstrated benefit in stroke reduction with tight glycemic control; however, reduction in other complications does occur. Reduction of stroke with antihyperlipidemic drugs.
Atrial fibrillation (Nonvalvular)			Adjusted-dose warfarin vs. control: 62% (CI 48% to 72%).
Age 50-59 years	0.5	1.5	Aspirin vs. placebo: 22% (CI 2% to 38%)
Age 60-69 years	1.8	2.8	Adjusted-dose warfarin vs. aspirin: 45% (CI 29% to 57%).
Age 70-79 years	4.8	9.9	
Age 80-89 years	8.8	23.5	
Asymptomatic carotid stenosis	2-8	2-7	Reduction of stroke with statins 50%reduction with endarterectomy Aggressive management of other identifiable vascular risk factors
Dyslipidemia			27% to 32% with statins in high-risk patients with coronary heart disease, hypertension, or diabetes; 25% reduction with high-dose vs. low-dose statins
High total cholesterol	25	15	
Low HDL cholesterol	25	10	
Obesity	17.9	12-20	Unknown
Physical inactivity	25	30	Unknown

Population-attributable risk is the proportion of ischemic stroke in the population that can be attributed to a particular risk factor. PAR=100{[Prevalence (Relative Risk-1)] / [Prevalence (Relative Risk-1)+1]}).

of stroke and that of CHD. Recognition of the most relevant modifiable risk-factors leads to the corresponding interventions being instigated. We will briefly examine and comment on some of the recommendations from the most recent guidelines, which are considered to be the most relevant tasks to be performed in a general practice setting and what has emerged from real-life surveys in cardiovascular and stroke prevention primary care settings.

Assessing the global Risk of a First Stroke

Each individual patient should have an assessment for their risk of stroke (Class I, Level of Evidence A). The use of a risk-assessment tool such as the Framingham Stroke Profile should be considered as these tools can help identify individuals who could benefit from therapeutic interventions and who may not be treated based on any one risk factor (Class IIa, Level of Evidence B).

The use of a targeted risk assessment tool, such as the Framingham Stroke profile (Tables 2,3) should be considered in the context of global cardiovascular risk evaluation, which is strongly recommended in the guidelines [7, 11]. In our opinion, the use of two different risk-assessment tools is in fact impractical in everyday practice and can be confusing both for the patients and physicians alike. Data from a survey conducted among Italian GPs demonstrated that among 446,331 patients from 481 PCPs registered in the Health Search/Thales database, the calculation of global cardiovascular risk was possible in only 10.1% of patients. Cardiovascular risk factors were more frequently recorded as age increased, and slightly more often for females than for males [12]. In the same study significant differences were reported between untreated and treated patients in terms of either blood pressure recording (32.8% vs. 80.6%), reporting of total cholesterol (31.0% of vs. 69.1%) or HDL cholesterol (17.9% vs. 49.9%). Such evidence suggests that there is a tendency to conduct risk assessments more frequently when patients are considered by their

Table 2. Modified Framingham risk score profile (modified from ref. 7).

Factors	Points										
	0	1+	2+	3+	4+	5+	6+	7+	8+	9+	10+
Men											
Age, years	54-56	57-59	60-62	63-65	66-68	69-72	73-75	76-78	79-81	82-84	85
Untreated SBP, mmHg	97-105	106-115	116-125	126-135	136-145	146-155	156-165	166-175	176-185	186-195	196-205
Treated SBP, mmHg	97-105	106-112	113-117	118-123	124-129	130-135	136-142	143-150	151-161	162-176	177-205
History of diabetes	No		Yes								
Cigarette smoking	No			Yes							
Cardiovascular disease*	No				Yes						
Atrial fibrillation	No				Yes						
Left ventricular hypertrophy	No					Yes					
Women											
Age, years	54-56	57-59	60-62	63-64	65-67	68-70	71-73	74-76	77-78	79-81	82-82
Untreated SBP, mmHg		95-106	107-118	119-130	131-143	144-155	156-167	168-180	181-192	193-204	205-216
Treated SBP, mmHg		95-106	107-113	114-119	120-125	126-131	132-139	140-148	149-160	161-204	205-216
History of diabetes	No			Yes							
Cigarette smoking	No			Yes							
Cardiovascular disease	No		Yes								
Atrial fibrillation	No						Yes				
Left ventricular hypertrophy	No				Yes						

physicians to be severe enough to be treated, rather than from the specific use of cardiovascular risk assessment tools. A consensus should therefore be reached on whether physicians should routinely rely only on global cardiovascular risk calculations or on the use of separate evaluations for stroke and CHD risk.

Cigarette smoking

Abstention from cigarette smoking and (for current smokers) smoking cessation are recommended (Class I, Level of Evidence B). Data from cohort and epidemiological studies are consistent and overwhelming [1,3,7,10,11]. Avoidance of environmental tobacco smoke for stroke prevention should also be considered (Class IIa, Level of Evidence C). The use of counselling, nicotine replacement, and oral smoking-cessation medications has been found to be effective for smokers and should be considered (Class IIa, Level of Evidence B). Data about PCPs' implementation of counselling for smokers in every-day practice are lacking. Primary care databases have however shown that smoking habits are recorded in 17% to 28% of the total number of patients [12], thus suggesting that counselling still remain a suggestion rather than a treatment strategy for stroke risk reduction. Laws against smoking in public places seem to be the most effective way to decrease passive-cigarette smoking; therefore every country should be urged to adopt such legislation. In our opinion, physicians' counselling should be strongly supported by the Governments, with repeated educational intervention targeting both smokers and people at risk of becoming smokers.

Screening for hypertension

Regular screening for hypertension (at least every 2 years in most adults and more frequently in minority populations and the elderly) and appropriate management (Class I, Level of Evidence A) are strongly recommended [11]. Primary care databases [12] clearly show that this recommendation has up to now been largely disregarded. Overall, blood pressure control was routinely performed in 21-28% of patients aged 30-49 years and in 54-60% of those aged 65-74 years.

Albeit improvement is both desirable and possible, it is improbable that those considered to be the most "healthy" will visit their physicians every two years. On the other hand, in low-risk patients, it is unusual to observe a substantial change in the CV risk profile over a two years period without the occurrence of new health problems which require medical intervention. In our opinion, less stringent periodic blood pressure (BP) measurements should be recommended for low-risk subjects in the general practice setting, while at least yearly BP measurements should be taken in those patients at moderate and high risk. This is in keeping with the CV prevention guidelines [10,11]. PCPs and Health Authorities can easily verify the implementation of periodic BP measurements. This may be extremely useful for audit procedures

Table 3. Probability of stroke within 10yrs for men and women 55–85yrs of age and free of previous stroke in the Framingham Heart Study (modified from ref. 7).

Framingham risk score	10-probability (%) of stroke Men	Women
1	3	1
2	3	1
3	4	2
4	4	2
5	5	2
6	5	3
7	6	4
8	7	4
9	8	5
10	10	6
11	11	8
12	13	9
13	15	11
14	17	13
15	20	16
16	22	19
17	26	23
18	29	27
19	33	32
20	37	37
21	42	43
22	47	50
23	52	57
24	57	64
25	63	71
26	68	78
27	74	84
28	79	
29	84	
30	88	

and for economical incentives - in the context of clinical governance programmes.

High blood pressure and cholesterol levels in diabetic patients

Hypertension should be tightly controlled (<130/80 mm Hg) in patients with diabetes. Treatment of adults with diabetes, especially those with additional risk factors, with a statin to lower the risk of a first stroke is recommended (Class I, Level of Evidence A) [11]. Recommendations to consider pharmacological treatment of diabetic patients with an Angiotensin converting enzyme-inhibitor (ACE-I) or Angiotensin II receptor blocker (ARB) are also endorsed [13].

However, data from the National Observatory on the Use of Pharmaceutical in Italy, indicate that in the year 2005 around 70% of patients with diabetes and hypertension were treated with ACE-I and ARBs, whereas less than 30% of the same patients were treated with statins or other antihyperlipidemic drugs [14]. The use of electronic medical records systems and computerized decision-making support systems (CDSS) have been suggested as potential means for facilitating the translation of research into practice by enhancing physicians compliance with evidence-based guidelines [15].

A previous study conducted in Italy [16] has demonstrated how the application of a simple CDSS integrated into a standard software for managing patients in general practice significantly increased (i.e. 14-18%) the rate of high-risk diabetic patients treated with antiplatelet drugs. Therefore, educational programmes aimed at increasing the use of such standards of care in general practice should be promoted by National Health Authorities.

Antithrombotic treatment in atrial fibrillation

Anticoagulation treatment among patients with atrial fibrillation who have valvular heart disease (particularly those with mechanical heart valves) is recommended (Class I, Level of Evidence A), whereas antithrombotic therapy (warfarin or aspirin) is recommended to prevent stroke in patients with nonvalvular atrial fibrillation according to the assessment of their absolute stroke risk, estimated bleeding risk, patient preferences, and access to high-quality anticoagulation monitoring (Class I, Level of Evidence A). Warfarin (INR 2.0 to 3.0) is recommended for high-risk (i.e. >4% annual risk of stroke) patients (and most moderate-risk patients according to an assessment of bleeding risk) with atrial fibrillation who have no clinically significant contraindications to oral anticoagulants (Class I, Level of Evidence A) [7]. Unfortunately, the risk level for stroke is not always used to guide warfarin use [17]. Low-cost improvement strategies are possible: audit procedure in primary care and use of automatic reminders both in primary and hospital care. Again, improvement is possible (see above) and should be pursued by Health Authorities.

Physical activity

Increased physical activity is recommended because it is associated with a reduction in the risk of stroke (Class I, Level of Evidence B). Exercise guidelines, such as those produced by the CDC and the National Institutes of Health, recommend regular exercise (>30 minutes of moderate-intensity activity daily) as part of a healthy lifestyle (Class IIa, Level of Evidence B).

Even if the benefit of increasing physical activity is unknown, the preventive value for cardiovascular

diseases is substantial [7]. Counselling is relatively simple, and the recommended minimal levels of exercise can be achieved without disrupting the "usual" weekly routine. Furthermore, regular physical activity is a pillar on the strategy to fight obesity. In our opinion, exercise advice could become a quality standard for all physicians involved in CV prevention. Simple counselling is time consuming and as such Health Authorities should recognise and adequately support physicians for the extra-time required for this important task. Meanwhile, Governments should promote physical activity, not only through educational campaigns, but also by removing obstacles which impair regular physical activities in every-day life.

Conclusions

Primary prevention of stroke among Italian PCPs should be substantially improved. The primary target of intervention should be high BP levels among patients with and without diabetes. However, new therapeutic strategies such as counselling for smoking cessation and physical activity are probably needed to control the global risk of stroke. Indeed, most of the high-risk patients encountered in general practice should be advised to initiate antiplatelet treatment, except in cases of extremely short life expectancy or where substantial contraindications exist. The use of automatic CDSS, if proven useful, can be rapidly and inexpensively implemented into the software systems of thousands of Italian GPs, thus improving the prognosis of high-risk individuals, and reducing the costs associated with stroke.

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