

Risk awareness in secondary stroke prevention: a review of the literature

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Abstract

Despite improvements in the diagnosis and treatment of cardiovascular disease through medical advances, it remains the largest single cause of disability and the second leading cause of death on a global scale. Despite this, patient awareness of cardiovascular risk is low and adherence to secondary prevention measures is inadequate. This combined with an ageing population could have serious consequences for both personal and health care costs. Risk management has been used to design strategies to prevent both primary and secondary stroke. These strategies have largely relied upon health professionals providing information, support and monitoring of patients conditions and control of individual risk factors. However, these strategies have not always been successful in the long-term management and prevention of secondary cardiovascular disease. This review explores the literature surrounding risk awareness as a tool to improve patient adherence to medications and lifestyle behaviours to reduce risk of secondary stroke.

Keywords

Stroke, risk awareness, prevention

Introduction

Stroke is the single largest cause of global adult disability¹ and secondary stroke is more likely to be fatal or cause major disability.² On a global scale, cardiovascular diseases are responsible for more deaths than any other cause.¹ Secondary stroke prevention strategies and risk factor treatment and management have been shown to reduce stroke recurrence.³ Causes of stroke are multi-factorial, however, the most important behavioural risk factors of heart disease and stroke include smoking, unhealthy diet, physical inactivity and harmful use of alcohol.¹ These behavioural risk factors are responsible for about 80% of coronary heart disease and cerebrovascular disease.¹ It has been suggested that patients with an established risk factor are more aware of their risk for future stroke,⁴ however other studies still suggest knowledge and awareness of stroke risk factors is poor amongst high-risk populations.^{5–7}

Despite improvements in the treatment of cardiovascular disease through medical advances and Government targets, adherence to secondary prevention measures is reportedly low⁸ with one study of over 2000 ischaemic stroke patients reporting one-quarter discontinuing one or more of their prescribed secondary prevention medications within 3 months.⁹ Moreover, after one year following a stroke, 22%

continue to smoke, 36% remain obese and 4% are drinking excessively.⁸ Different behavioural risk factors tend to be associated with specific socio-demographic groups within a stroke population, e.g. younger, white males were more likely to smoke while non-white women were more likely to be obese.⁸

Although in coronary artery disease (CAD) illness beliefs have been shown to influence behaviour with perceptions of more serious consequences predicting better adherence,¹⁰ this has not been the case for stroke survivors.^{11,12} The reasons for this are unclear but the differences may have something to do with the patient's perception of their risk of further illness.^{13,14} International studies have shown that patients are unlikely to call for urgent attention if they or a family member suffer a stroke.^{5–7,15} This suggests for primary stroke, they and/or their family members either do not see the urgency in the need for attention for stroke or believe even if they hurry to hospital nothing can be done.

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Methods

A systematic approach was taken to identify and examine the current literature with regard to secondary stroke prevention, stroke patient risk awareness and stroke risk factor management. A search of the following databases Pubmed, Medline and Google Scholar identified journal articles as well as reports from organisations such as the World Health Organisation¹ with information regarding the current status of cardiovascular disease prevention and risk factor management.³

Risk awareness

Studies addressing knowledge of future event risk of stroke have focussed on the general public (and then predominantly the Caucasian population), but one study which looked at knowledge of risk in high-risk patients showed that only 42% of patients with a history of previous stroke were aware of their future stroke risk and only 27% recalled being informed of their risk by a physician.⁵ Previous work by the authors has also identified low levels of risk awareness in high-risk stroke patients with only 41% reporting being at risk of a future event.¹⁴ The public's under-appreciation of the potential seriousness of stroke may be a reason for decreased compliance with secondary stroke prevention measures.¹³ Poor patient awareness and knowledge have resulted in sub-optimal adherence to risk modifications.¹⁶ Conversely, providing information about atherosclerosis may improve adherence to intervention protocols such as medications and lifestyle modifications¹⁷ as we have seen in educational marketing campaigns, public awareness of the signs and symptoms of stroke have improved early recognition resulting in the provision of new treatment advances such as thrombolysis for acute ischaemic stroke.¹⁸

Specialist charitable organisations have been responsible for improvements in public awareness with recent surveys suggesting an increase in knowledge of stroke signs and symptoms from 45% to 85%¹⁹ mainly due to media campaigns such as Face, Arm, Speech and Time (F.A.S.T.).¹⁹ However, stroke patients are still slower than cardiac patients at attending hospital urgently with their symptoms and stroke patients may not recognise future signs and symptoms of stroke which differ from their original symptoms.⁵⁻⁷

Awareness of the future risk of another stroke differs from knowledge or awareness of individual stroke risk factors. Increased knowledge of stroke risk factors is significantly associated with younger age, a higher educational level and not living alone.²⁰ Well educated patients from high social classes are known to be

more knowledgeable and compliant with health care advice than those from less privileged backgrounds.²¹ Indeed, even knowledge about hypertension and its aetiological role as a risk factor for stroke is not only poorly realised but partly associated with educational background.²² Therefore, the challenge for health professionals is how to educate members of the public and patients about risk factors and other health messages, however, this challenge has been on-going for decades and is linked to health literacy. More research on patient behaviours post stroke will inform future campaigns to improve the effectiveness of health messages to all members of society particularly those at high risk from vascular disease.

It has been suggested that knowledge of risk factors appears to be higher amongst those who already have an established risk factor.⁴ Despite this, only 41% of high-risk people in one study were aware that they were at greater risk of stroke.⁵ However, Nicol and Thrift⁴ identified that people with risk factors more commonly identify those risk factors when asked and suggest those people who can identify risk factors are more likely to identify themselves as being at risk of stroke.⁶ This is an important factor for health professionals to understand during consultations with patients to ensure the health message education is understood and retained as it could impact on future risk factor awareness and influence possible choices of behaviour. Barriers to risk awareness have also been identified as socio-economic and age-related⁵ as well as gender-specific.

Several barriers to risk factor control have been identified in various studies and include inadequate follow-up and monitoring of stroke survivors by health care professionals, inadequate prescribing of secondary prevention therapies, poor information provision and inadequate self-management of risk factors by patients.²³⁻³¹ Raine et al.³⁰ studied general practice records between 1995 and 2005 and found only 25.6% of men and 20.8% of women received secondary stroke prevention. It is also important to consider an individual is not likely to initiate, change or maintain health behaviour in the face of barriers, unless they have a core belief they have the personal resources to do so. An individual's motivational and self-regulatory skills are imperative in any behaviour change intervention and will happen if they have the personal belief that they are able to successfully achieve the change.³²

Risk management

Risk management is used to design strategies to prevent both primary and secondary stroke. These strategies have largely relied upon health professionals providing information, support and monitoring of patients'

conditions and control of individual risk factors for stroke such as BP, cholesterol, diabetes and smoking status. However, these strategies are not always initiated possibly due to conflict between providing a patient centred approach and the goals of public health.³³ Social influences impact on patient beliefs, adherence to medication and lifestyle advice as well as the socio-economic challenges of low economic status and educational levels as well as ethnicity and cultural disparities.

Studies to identify specific risk differences in varying ethnic populations are useful to understand which groups are at high risk from certain vascular risk factors, e.g. South Asians are 50% more likely to have an MI or angina and Bangladeshi's have the highest rates of CVD. In contrast, men born in the Caribbean and living in the UK are 50% more likely to die of a stroke than the general population.³⁴ Despite the biological differences, ethnicity also involves cultural and religious variables which effect behaviour of patients and health professionals. Racial origin may be a determinant of the type and level of health care received³⁵ and patient's values and beliefs influence behaviour.^{36,37} Variations also exist in cultural diversity training for health care professionals across the UK depending on profession and region with a quarter (25%) of health care professional trainees not receiving any formal cultural diversity training.³⁸

Provision of information alone is rarely sufficient to affect health behaviour change (there are few smokers, if any, who are unaware of the message that 'smoking kills'); however, it remains a crucial element of health education.³⁹ Due to the challenge this presents and the rise in the need for communication of risk to patients and the general public in order to increase self-management of chronic health conditions, the communication of risk information has recently received increased national attention through policy development.^{39,40}

Individuals are more responsive to information about relative risk than absolute risk, with the former having greater influence over decision making.⁴¹ It has also been suggested that an individual's perceptions of severity of the targeted health threat are as influential as perceptions of risk in relation to motivating behaviour change.^{42,43} Provision of risk information should also be accompanied by a personally tailored action plan of where and how the risk reducing behaviour may be implemented within the context of that individual's current lifestyle.⁴⁴ Explicit in any risk communication should be an explanation of the process whereby the risk leads to the disease and the process through which that risk is reduced when health behaviour is altered or undertaken. Edwards et al.⁴¹ suggest risk information is important to increase risk awareness, which may influence patients' health behaviour choices, however how

the risk information is understood and retained by patients remains the biggest challenge for health professionals.

Studies have shown that the provision of information may improve knowledge but has not been found to improve perceived health status.⁴⁵ Patient's own perspectives about stroke illness and recovery may be as important as influence over emotional adjustment and adherence to medical recommendations.⁴⁶ Wolf et al.⁴⁷ suggested that information about one's risk of stroke may provide the impetus for risk factor modification. Risk awareness after first stroke has been observed to influence behaviour post stroke and in relation to prevention of further stroke.¹⁴ The dissemination of risk information is necessary if reductions in risk are to be achieved⁴¹ and studies which include interventions to communicate risk are useful to identify if risk awareness can improve adherence to secondary prevention strategies or the likelihood that patients will participate in behaviour changes to reduce risk.

Studies have been performed using strategies such as enhanced educational programmes to impact on behaviour and improve adherence to secondary prevention strategies following stroke.^{31,48-50} From reviews of interventions to improve adherence or alter behaviours, few have had significant results, and of the randomised controlled trials performed specifically in stroke, the most effective study used an integrated care model of multiple components and an integrated management system to demonstrate improved effects on risk-factor management.⁵¹ The complete multidisciplinary team commitment is an example of a 'gold standard' of stroke care, but the multiple intervention components would be costly and difficult to coordinate in the long term and would require excellent communications between secondary and primary care. Although these elements should be expected, it would be challenging to implement these strategies across every stroke service in the country. Nevertheless, in-hospital initiation of secondary prevention therapies yielded high rates of adherence in the stroke Preventing Recurrence of Thrombo-embolic Events Through Co-ordinated Treatment (PROTECT) program.⁵² This project delivered eight medication/behavioural secondary prevention measures known to improve outcomes in patients with cerebrovascular disease.⁵² The medication goals were

- Antithrombotic
- Statin
- ACE
- Thiazide Diuretic
- The four behavioural goals were
- Smoking cessation counselling
- Exercise counselling
- Diet counselling
- Education about personal risk factors

High rates of adherence to the measures were observed at 3 months and suggest the inpatient setting provides a unique window of opportunity for the initiation of secondary prevention measures.

The initiation of secondary prevention measures as an inpatient have been shown to be effective in other diseases such as coronary heart disease where good outcomes were demonstrated and led to a revision of national guidelines to endorse the approach as a national standard of care in patients with cardiac disease.⁵³ Currently, stroke care guidelines provide evidence-based treatment targets but do not suggest how secondary prevention should be initiated or managed. However, they do suggest, as the risk of stroke following the initial event is high, prevention ought to be initiated as soon as possible after the event.¹⁸ Urgent use of existing preventive treatments was associated with an 80% reduction in risk of early recurrent stroke following a prospective study with the primary outcome as risk of stroke within 90 days of first seeking medical attention following stroke.²

Conclusions

The literature demonstrates the lack of risk awareness in patients at high risk of secondary stroke and identifies factors that influence risk awareness as well as the barriers to understanding and awareness. This review has identified how risk awareness differs from risk factor knowledge and suggests perception of risk may influence individuals adherence and behaviours post stroke. Studies have highlighted effective educational programmes to improve knowledge and awareness which are effective but costly. Health professionals should consider risk awareness education as a tool for improving adherence and lifestyle modification during consultations with high-risk patients. Further studies are required to investigate ways in which the risk awareness health message can be conveyed in such that patients understand their risk of future stroke and alter their behaviour in response to the risk.

Competing interests

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