RESEARCH

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THIS WEEK'S RESEARCH QUESTIONS

491 When and where do nurse led interventions for hypertension improve outcomes, compared with usual care?

492 What is the association between migraine—with or without aura—and risk of haemorrhagic stroke?

493 What contributes to the increased mortality experienced by people with migraine?

493 What factors affect decision making by family carers on behalf of people with dementia?

ZEPHYR/SPL

TEHOM

Cardiovascular risks of migraine with aura

The Women's Health Study was a randomised, double blind, placebo controlled trial in which nearly 40 000 female health professionals were randomly assigned to vitamin E or placebo, and to aspirin or placebo (http://clinicaltrials.gov/ct2/show/NCT00000479). Randomisation ended in 1996 and the primary endpoint was risk of all important vascular events (a composite of nonfatal myocardial infarction, nonfatal stroke, and total cardiovascular death) and of total epithelial cell cancers. Follow-up of nearly 30 000 of the trial cohort continued until March 2009, prompting a wide range of subsequent research questions.

Tobias Kurth and colleagues report this week that women who had migraine with aura at baseline in the study—when compared with women without migraine—went on to have four additional haemorrhagic strokes per 10 000 women per year (in all 85 haemorrhagic strokes occurred during the 13 year follow-up period) (p 492). Larus Gudmundsson and colleagues looked at a different cohort: 18 725 men and women from Reykjavik, finding that migraine with aura was an independent risk factor for cardiovascular and all cause mortality in both men and women (p 493). It was a weaker risk factor than many others, however, such as smoking, diabetes, and high blood pressure.

So what should doctors say to patients with migraine? In a linked editorial Klaus Berger and Stefan Evers urge caution, and argue that "for many people the information [from these and other similar observational studies] will cause an unwarranted amount of anxiety, although others may use the opportunity to modify their lifestyle and risk factors accordingly" (p 465).

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ANTONIA REEVE/SPL

Implementation of nationwide electronic health records
Although introduction of a standardised national electronic records system will no doubt improve patient care, you won't be surprised to find out that implementing such a service throughout an organisation as huge and diverse as the NHS "will be a long, complex, and iterative process." That's the bottom line of Ann Robertson and colleagues' research into the NHS Care Records Service (doi:10.1136/bmj.c4564), which evaluated the experiences of five "early adopter" secondary care trusts. Implementation has been stymied by following a top-down, centrally driven policy and has evolved to be more responsive to the needs of individual trusts. But a "bottom-up" approach would be equally ineffectual, warn the authors; a "middle-out" approach that combines increased local autonomy with central support for national goals and common standards would be most appropriate.

RUTH JENKINSON/MIDIRS/SPL

Blood pressure services delivered by nurses

The interventions in this systematic review by Christopher E Clark and colleagues included nurse support delivered by telephone (seven studies), community monitoring (defined as home or other non-healthcare setting; eight studies), and nurse led clinics held in primary (13 studies) or secondary care (six studies) (p 491). Their findings concur with common sense: clinical outcomes are best when nurses use algorithms to deliver care for hypertension. The quality of the studies was only moderate, however, and the authors particularly note the lack of high quality studies of nurse led care for uncomplicated hypertension in the UK.

Nurse led interventions to improve control of blood pressure in people with hypertension: systematic review and meta-analysis

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STUDY QUESTION

What is the evidence in primary care for improved outcomes using a nurse led intervention for hypertension compared with usual care?

SUMMARY ANSWER

Nurse led interventions for hypertension require an algorithm to structure care. There is evidence of improved outcomes with nurse led clinics in primary care, and with nurse prescriber led care from non-UK healthcare settings.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Nurses are integral members of the primary healthcare team and are involved in the management of hypertension; previous reviews have suggested that nurse led care may be beneficial in hypertension care but the data are conflicting. This review supports structured algorithm driven care of hypertension delivered by nurses and nurse prescribers.

Selection criteria for studies

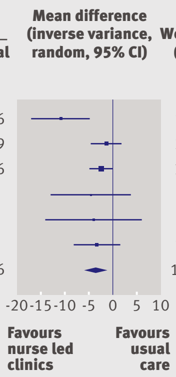
We identified randomised controlled trials that compared any intervention designed to improve blood pressure delivered by nurses with usual care in adults aged 18 or over, using an electronic search for English language articles in Medline, Embase, the Cochrane Central Register of Controlled Trials, British Nursing Index, Cinahl, Database of Abstracts of Reviews of Effects, and the NHS Economic Evaluation Database. We searched from January 2003 to November 2009 using a strategy modified from a previous Cochrane review and identified older citations from this review. To identify further citations we corresponded with the review's author.

CHANGES IN SYSTOLIC BLOOD PRESSURE FOR PRIMARY CARE NURSE LED CLINICS COMPARED WITH USUAL CARE

Study	Nurse led care			Usual care			Weight (%)	Mean difference (inverse variance, random, 95% CI)
	Mean	SD	Total	Mean	SD	Total		
Change in systolic blood pressure								
Hill 2003*	-7.5	22.2	125	3.4	25.0	106	11.7	-10.90 (-17.05 to -4.75)
Kastarinen 2002 (treatment)	-6.0	17.3	185	-4.7	14.0	189	26.5	-1.30 (-4.49 to 1.89)
Kastarinen 2002 (no treatment)	-2.0	11.5	175	0.4	10.8	166	33.6	-2.40 (-4.77 to -0.03)
O'Hare 2004	-6.7	21.2	41	-2.1	17.47	40	7.0	-4.60 (-13.05 to 3.85)
Woollard 1995	-8.0	31.1	46	-4.0	16.8	48	5.0	-4.00 (-14.17 to 6.17)
Woollard 2003	-3.1	10.0	54	0.2	15.9	57	16.2	-3.30 (-8.21 to 1.61)
Total (95% CI)			626			606	100.0	-3.48 (-5.88 to -1.08)

Test for heterogeneity: $\tau^2=3.00$, $\chi^2=7.86$, df=5, P=0.16, $I^2=36\%$

Test for overall effect: z=2.84, P=0.005



* Good quality study

Primary outcomes

The primary outcome measures were absolute outcome systolic and diastolic blood pressures, changes in systolic and diastolic blood pressure, proportion of patients reaching target blood pressure, and proportion taking blood pressure drugs.

Main results and role of chance

We included 33 studies; 32 contributed to the quantitative analysis. Interventions were categorised as nurse support delivered by telephone (seven studies), community monitoring (defined as home or other non-healthcare setting; eight studies), or nurse led clinics held in primary (13 studies) or secondary care (six studies). Fourteen studies included a stepped treatment algorithm and nine included nurse prescribing in their protocol. Compared with usual care, interventions including a stepped treatment algorithm showed greater reductions in systolic blood pressure (weighted mean difference −8.2 mm Hg, 95% confidence interval −11.5 to −4.9), nurse prescribing showed greater reductions in blood pressure (systolic −8.9 mm Hg, −12.5 to −5.3 and diastolic −4.0 mm Hg, −5.3 to −2.7), telephone monitoring showed higher achievement of blood pressure targets (relative risk 1.24, 95% confidence interval 1.08 to 1.43), and community monitoring showed greater reductions in blood pressure (weighted mean difference, systolic −4.8 mm Hg, 95% confidence interval −7.0 to −2.7 and diastolic −3.5 mm Hg, −4.5 to −2.5). Nurse led clinics in primary care showed greater reduction of blood pressure compared with usual care (weighted mean difference, systolic −3.5 mm Hg, −5.9 to −1.1 and diastolic −1.9 mm Hg, −3.4 to −0.5).

Bias, confounding, and other reasons for caution

Study quality was moderate, with adequate random sequence generation in 70% (23/33) of studies, allocation concealment in 58% (19/33), and blinding of data collection in 43% (14/33). Thirteen studies were adequate in two of the three domains and adequate or unclear for the third and were defined as "good quality" studies for sensitivity analysis. No good quality studies of uncomplicated hypertension originated from the United Kingdom. Method of blood pressure measurement was not described in 12 studies, 10 used automated monitors, and seven referred to published measurement guidelines.

Study funding/potential competing interests

This research was supported by the Scientific Foundation Board of the Royal College of General Practitioners and by the South West GP Trust. We have no competing interests.

CME

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Migraine and risk of haemorrhagic stroke in women: prospective cohort study

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EDITORIAL by Berger and Evans
RESEARCH p 493

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STUDY QUESTION

What is the association between migraine or migraine aura status and risk of haemorrhagic stroke?

SUMMARY ANSWER

Women with migraine with aura have about twice the risk of haemorrhagic stroke compared with women without a history of migraine.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Migraine with aura has been associated with an increased risk of ischaemic stroke and other ischaemic vascular events. Migraine with aura might also be a marker of increased risk of haemorrhagic stroke.

Participants and setting

We included female health professionals who participated in the US based Women's Health Study, who were aged ≥45 and who were free from cardiovascular disease and other major disease at baseline.

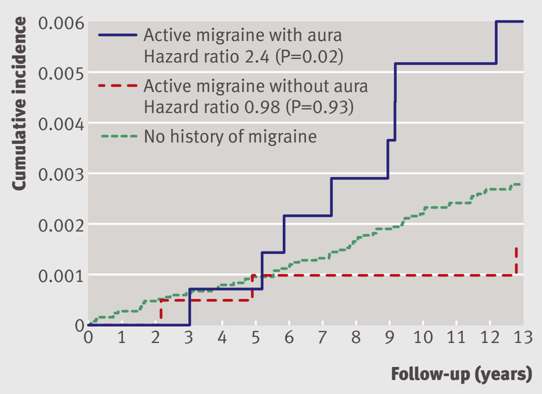
Design, size, and duration

The prospective cohort study among 27 860 women started in 1993, when women were ask to report detailed information on migraine headache, personal characteristics, and lifestyle factors and provide a blood sample. During a mean of 13.6 years of follow-up, 85 haemorrhagic strokes were confirmed by an endpoints committee of physicians after medical record review.

Main results and the role of chance

Compared with women without a history of migraine, there was no increased risk of haemorrhagic stroke in those who reported any history of migraine (adjusted hazard ratio 0.98, 95% confidence interval 0.56 to 1.71, P=0.93). In contrast, risk was increased in women with active migraine with aura (2.25, 1.11 to 4.54, P=0.024). The age adjusted cumulative incidence of haemorrhagic stroke increased with longer follow-up for women with migraine with aura. Compared with women without migraine, after adjustment for age and an assumption of causality, four additional haemorrhagic stroke events were attributable to migraine with aura per 10 000 women per year. The age adjusted increased risk was stronger for intracerebral haemorrhage (2.78, 1.09 to 7.07, P=0.032) and for fatal events (3.56, 1.23 to 10.31, P=0.02). While we found no significant effect modification, our results suggest stronger associations among women aged 55 and above and among women with a generally more favourable vascular risk profile. Women who reported active migraine without aura had no increased risk for haemorrhagic stroke.

AGE ADJUSTED CUMULATIVE INCIDENCE OF HAEMORRHAGIC STROKE ACCORDING TO MIGRAINE STATUS



Bias, confounding, and other reasons for caution

The relatively low number of haemorrhagic stroke events should caution against definitive conclusions. Migraine and migraine aura were self reported and misclassification is possible. Because of the prospective design, however, such misclassification is expected to be random. We controlled for a large number of potential confounders in multivariable models, but residual confounding remains possible as our study is observational.

Generalisability to other populations

All participants were female health professionals aged 45 or older and most of them were white, which could limit generalisability to other populations.

Study funding/potential competing interests

The Women's Health Study is supported by grants from the National Heart, Lung, and Blood Institute (HL-043851 and HL-080467), and the National Cancer Institute (CA-047988). The research for this work was supported by grants from the Donald W Reynolds Foundation, the Leducq Foundation, and the Doris Duke Charitable Foundation.

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- Efficacy of prophylactic human papillomavirus quadrivalent vaccine (*BMJ* 2010;341:c3493)
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- Method of attempted suicide as predictor of subsequent successful suicide (*BMJ* 2010;341:c3222)
- Novel approach to antibiotic prophylaxis in percutaneous endoscopic gastrostomy (*BMJ* 2010;341:c3222)

Migraine with aura and risk of cardiovascular and all cause mortality in men and women: prospective cohort study

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STUDY QUESTION Is migraine associated with increased mortality from cardiovascular disease, other causes, and all causes?

SUMMARY ANSWER Migraine with aura is an independent risk factor for cardiovascular and all cause mortality in men and women. The risk of mortality from coronary heart disease and stroke is increased in people with migraine, particularly those with aura.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS Migraine, particularly with aura, has previously been linked to an increased risk of cardiovascular disease. Previous studies found no increased risk of death from cardiovascular disease in people with migraine (with and without aura combined). Migraine with aura is an independent risk factor for cardiovascular and all cause mortality in both men and women.

Participants and setting

Participants comprised 18 725 men and women, born 1907-35 and living in Reykjavik.

Design, size, and duration

This was a population based cohort study. Questionnaires and clinical measures were obtained in mid-life (mean age 53, range 33-81) in the Reykjavik study (1967-91). Headache was classified as migraine without aura, migraine with aura, or non-migraine headache. Median follow-up was 25.9 years (0.1-40.2 years), with 470 990 person years and 10 358 deaths: 4323 from cardiovascular disease and 6035 from other causes. We used Cox regression to estimate risk of death in those with migraine compared with others, after adjusting for baseline risk factors.

Main results and the role of chance

People with migraine with aura were at increased risk of all cause mortality (adjusted (for sex and multivariables) hazard ratio 1.2, 95% confidence interval 1.1 to 1.3) and mortality from cardiovascular disease (1.3, 1.1 to 1.4) compared with people with no headache, while those with migraine without aura and non-migraine headache were not. Further examination of mortality from cardiovascular disease shows that people with migraine with aura were at increased risk of mortality from coronary heart disease (1.3, 1.1 to 1.5) and stroke (1.4, 1.1 to 1.8). Women with migraine with aura were also at increased risk of mortality from non-cardiovascular disease (1.2, 1.1 to 1.4).

Bias, confounding, and other reasons for caution

Although our classification of migraine precedes the 2004 IHS criteria, the questions are similar to those currently asked and cover the most common symptoms. We did not ask about symptoms in those who reported having headache less than once a month and so are therefore likely to capture only those with higher attack frequency. People who had migraine with aura exclusively, without headache, would be included in the “no headache” group. We cannot draw any conclusions from the current study about the risk of mortality for people with migraine with low frequency of attacks (less than once a month) and those with migraine with aura without headache. The prevalence of aura (as a proportion of the total migraine population) is higher than has been reported in other population studies and might include commonly occurring non-specific visual symptoms such as blurring. The result of this misclassification would probably attenuate the relation between migraine with aura and mortality. As a risk factor migraine is weaker than major established risk factors, such as smoking, diabetes, and high blood pressure.

Generalisability to other populations

The cohort is population based, which adds to the generalisability of our results.

Study funding/potential competing interests

This study was funded by the University of Iceland Research Fund. The funders had no involvement in the conduct of the study or preparation of the manuscript. LSG has received a travel grant from the Pharmaceutical Society of Iceland Science Fund, AIS has served on advisory boards for Endo Pharmaceuticals and OrthoMcNeil Neurologics and has received an honorarium and a travel grant from the National Headache Foundation and a travel grant from the American Headache Society.

RISK OF DEATH FROM CARDIOVASCULAR DISEASE ACCORDING TO MIGRAINE STATUS

	Died/total	Hazard ratio (95% CI)
No headache	3147/13 071	1.0 (reference)
Non-migraine headache	765/3631	1.0 (1.0 to 1.1)
Migraine:		
Overall	411/2023	1.2 (1.1 to 1.4)
Migraine without aura	104/626	1.1 (0.9 to 1.3)
Migraine with aura	307/1397	1.3 (1.1 to 1.4)

Making decisions for people with dementia who lack capacity: qualitative study of family carers in UK

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bmj.com/podcasts
Listen to Claudia Cooper talk about the problems faced by family carers of people with dementia at www.bmj.com/podcasts

STUDY QUESTION

What are the facilitators of and barriers to common difficult decisions made by family carers on behalf of people with dementia?

SUMMARY ANSWER

Family carers found difficulties in making proxy decisions, especially against active resistance, and in their altered role of patient manager while still a family member; families devised strategies to gain agreement to ensure that the person with dementia retained dignity.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

A large and increasing number of family carers make decisions for relatives with dementia but find it distressing and lack information and emotional support. Support for carers to make these decisions is important; the strategies from this study will be made available to carers and professionals.

Rationale, design, data collection method

A large and increasing number of family carers make proxy decisions for a relative with dementia, either by themselves or by advising professionals. This qualitative study delineated decision areas through focus groups and explored difficult decisions already made in individual interviews.

Participants and setting

We interviewed 43 family carers of people with dementia in focus groups and 46 carers who had already made such decisions individually.

Recruitment/sampling strategy

We aimed for a sample with maximum variation. People were recruited through primary and secondary care services and from a specialist neurology clinic.

Data analysis method

We used a thematic content analytic approach.

Main findings

Family carers identified five core problematic areas of decision making: accessing dementia related health and social services; care homes; legal-financial matters; non-dementia related health care; and making plans for the person with dementia if the carer became too ill to care for them. Several strategies helped with implementing decisions. To access services, the carer made the patient's general practice appointments, accompanied them to the surgery, pointed out symptoms, gained permission to receive confidential information, asked for referral to specialist services, and used the professionals' authority to gain the patient's agreement. Other useful strategies were introducing change slowly, organising legal changes for the carer as well as the patient, involving a professional to persuade the patient to accept services, and emphasising that services optimised rather than impeded independence. End of life decisions were helped by knowing the person with dementia's previous views, clear prognostic information, and family support.

People's comments during interviews

- "I used to [be] a bit conniving . . . say I'm coming to see the doctor, for me; that's the only way I could get her to the surgery, and then you start talking . . . she loved the doctor." (husband of early onset patient)
- "He was sort of in denial. . . He convinced the doctor there was nothing wrong." (wife)
- "She wasn't washing herself, she kept saying 'no, I don't want [carers]. . .' She [healthcare professional] said 'you can try and help slowly' . . . I said 'yes we will try it once a week. . .' They started a care package and it is every day now." (son)
- "So long as you say . . . 'doctor' in the sentence . . . she will go along with that, she will listen to that authority so that's been good actually." (daughter)

Implications

Supporting carers to make decisions is an important and urgent next step. We have devised factsheets from this study for family carers about overcoming barriers. These are available on bmj.com.

Bias, limitations, generalisability

Participants recognised themselves as carers of people with dementia, so we may have missed people who did not see themselves as carers or whose relative had not received a diagnosis. Nevertheless, some participants had originally not accepted that their relative had dementia, or their relative had refused to go to doctors. We did not assess the patients' decision making ability, and some may have retained capacity in the specified situation. All people with dementia were aged 50 or over. Their respect for doctors may be generational, but younger carers also emphasised how professionals' authority helped emotionally and practically. Carers and people with dementia may have differing views, and this is not always related to the dementia.

Study funding/potential competing interests

The study was funded by BUPA Foundation. All the researchers are independent of the funders.