

## UPTAKE OF THE INFLUENZA VACCINE AMONGST AN ACUTE GENERAL MEDICINE INPATIENT POPULATION

C. LISK, I. CHEMMANAM, N. STANLEY

Department of Medicine, Lister Hospital, Stevenage

### Introduction

Influenza is responsible for significant morbidity and mortality each year in the UK. The Department of Health (DOH) recommends that influenza vaccination is given to all persons aged 65 and over, and those with chronic illnesses as they are at highest risk. We investigated the uptake of the influenza vaccination in an acute general medical inpatient population looking in particular at the factors responsible for non-immunisation in at risk patients.

### Methodology

291 consecutive patients admitted to our acute medical admissions unit over a two week period were prospectively identified and interviewed. The DOH guidelines on clinical risk categories were used to identify patients who should have received influenza vaccination. Patients were analysed according to their eligibility for and uptake of influenza vaccination as well as reasons for non-immunisation.

### Results

100 (34%) patients were identified who required influenza vaccination. 55 were female and the median age was 69 years (range 43 – 96). 66 had received the influenza vaccine. The majority fell into more than one risk category; the commonest being age 65 and over (65), chronic heart disease (57) and chronic respiratory disease (36). 34 patients did not receive vaccination; the commonest reason was lack of awareness (12) and risk category age 65 and over (14). Patients with diabetes were the commonest risk group stating lack of awareness as the reason for non-immunisation (8). 79 patients said they would have the influenza vaccination next winter.

### Conclusion

1/3 of patients eligible for vaccination did not receive the flu vaccine. This highlights the need to raise awareness amongst health care workers on risk groups for immunisation. This may be particularly important in diabetics.

## A RAPID ACCESS TRANSIENT ISCHAEMIC ATTACK CLINIC EXPEDITES SURGERY FOR SYMPTOMATIC CAROTID ARTERY STENOSIS

J. BIRNS, M. VILASUSO AND D.L. COHEN

Harrow Stroke Unit, Northwick Park Hospital, Harrow, Middlesex

### Introduction

Rapid assessment of transient ischaemic attacks (TIAs) is required by April 2004. We compared the performance of a rapid access TIA clinic with general neurology outpatients.

### Methodology

During 2001, 251 patients referred to a rapid access TIA clinic were compared with 45 patients seen in neurology outpatients.

### Results

Referrals to TIA clinic were older (median: 71 years; range: 21–91) than to neurology clinic (median: 58 years; range: 29–79). The times taken between a patient suffering from a TIA and their subsequent assessment, investigation and management are detailed in the table below.

Median time (days) between	Event & clinic	Referral & clinic	Clinic & carotid duplex	Carotid duplex & endarterectomy	Event & carotid endarterectomy
TIA	28	23	0	10.5	29.5
Clinic	(n = 223)	(n = 194)	(n = 185)	(n = 4)	(n = 2)
Neurology	129	93.5	14.5	92	178
Clinic	(n = 45)	(n = 42)	(n = 26)	(n = 2)	(n = 6)
	p < 0.00001	p < 0.00001	P < 0.00001	p = 0.11	p = 0.07

A much greater proportion of patients seen in neurology clinics (89%) underwent brain imaging compared with patients seen in the TIA clinic (12%). Less than 5% of patients in both clinics underwent carotid endarterectomy. Whilst the difference in times between TIA and endarterectomy was not statistically significant between the two clinic populations, all patients with symptomatic carotid artery stenosis seen in the TIA clinic underwent surgery within the critical first three months.

### Conclusion

A designated TIA clinic enables patients with a TIA to be assessed and managed much faster than referral to conventional neurology outpatients. This has implications for the optimal treatment in patients with significant carotid artery stenosis.

## IS CLINICAL MEASUREMENT OF SPASTICITY FOLLOWING STROKE, USING THE MODIFIED ASHWORTH SCORE, VALID?

R. KUMAR<sup>1</sup>, A. SHARMA<sup>1</sup>, D. PANDYAN<sup>2</sup>

*Stroke Team for Audit and Research<sup>1</sup>, University Hospital Aintree, Liverpool and Department of Physiotherapy Studies<sup>2</sup>, Keele University, Staffs*

### Introduction

Treating spasticity, an impairment that contributes to disabilities in more than two thirds of the stroke population, can lead to improvement in quality of life. To evaluate efficacy of these treatments there is a need for valid and reliable clinical measures. Existing clinical measures of spasticity (e.g. modified Ashworth scale -MAS) may not have sufficient validity. We aimed to assess the criterion validity of the MAS.

### Methodology

We conducted a cross sectional study in people with elbow flexor spasticity following stroke. Resistance to passive movement (RPM) was simultaneously graded (MAS) and measured (biomechanically) at the elbow. Speed of passive movement was also calculated. The assessor was blinded to the biomechanical measures.

### Results

One hundred and eleven patients participated and thirteen had primary intracerebral hemorrhages. The MAS was "0" in 15, "1" in 15, "2" in 14, "3" in 13, "4" in 43 and "5" in 11 patients. ANOVA showed significant differences in RPM and speed between the MAS grades ( $p < 0.01$ ). The Tukey's Post hoc test demonstrated that patients with MAS score of "4" and "5" had a significantly higher RPM and were moved significantly slower than people with a MAS scores of "3" and less ( $p < 0.01$ ). There were no significant differences between MAS scores "0", "1", "2" and "3" ( $p > 0.05$ ).

### Conclusion

The MAS, in its current form, may not have sufficient validity to measure RPM. It is not possible, under clinical conditions, to measure RPM with a constant velocity. Therefore, to use the MAS as a clinical measure of spasticity is not valid.

## THE INFLUENCE OF ADMISSION RANDOM BLOOD GLUCOSE MEASUREMENT ON HOSPITAL MORTALITY IN PATIENTS WITH ACUTE STROKE

R. KUMAR<sup>1</sup>, A. SHARMA<sup>1</sup> AND I. MACFARLANE<sup>2</sup>

*Stroke Research Unit<sup>1</sup> and Diabetes and Endocrinology Department<sup>2</sup>, University Hospital Aintree, Liverpool*

### Introduction

Hyperglycaemia could be present in upto 50 % of patients following an acute stroke, but its effect on stroke mortality is unclear. We aimed to determine the effect of blood glucose measurement at admission on mortality in hospital following an acute stroke.

### Methodology

1523 consecutive patients admitted to a University Hospital with acute stroke were studied. The random blood glucose (BG) was measured at admission. Inpatient mortality was assessed across increasing glucose levels in both diabetic (245; 16%) and non-diabetic (1278; 84%) patients.

### Results

1118 (73.4%) survived and were discharged. The mean BG (mmol/L) was significantly higher in the deaths versus survivors; diabetics 13.03 v 11.52 ( $p < 0.001$ ), non diabetics 7.55 v 6.73 ( $p < 0.001$ ). Overall there was a significant trend of increasing mortality ( $p < 0.001$ ) with each mmol rise in BG from 6 to 12 peaking at 9 – 10. Logistic regression showed hyperglycaemia (BG > 7) to be the strongest predictor (odds ratio 1.84,  $p < 0.001$ ) followed by stroke severity and age. Survival analysis using Cox's proportional hazards model (relative hazard 1.46,  $p < 0.001$ ) and Kaplan Meier survival curve (log rank test,  $p < 0.001$ ) also showed hyperglycaemia to be strong predictors of mortality.

### Conclusion

Admission hyperglycaemia is a strong independent predictor of hospital mortality following stroke, irrespective of diabetic status. Mortality increases with rising blood glucose levels and this is apparent at a lesser degree of hyperglycaemia than mortality following acute cardiac events. Studies of tight blood glucose control soon after stroke should be carried out.

## VALIDITY OF THE TELEPHONE INTERVIEW FOR COGNITIVE STATUS (TICS) IN POST-STROKE SUBJECTS

M. BARBER AND D.J. STOTT

Academic Section of Geriatric Medicine, Royal  
Infirmary, Glasgow, UK

### Introduction

Cognitive impairment and dementia are very common after acute stroke. Telephone screening has potential advantages for clinical follow up and population-based research in this group. We wished to test the validity of the Telephone Interview for Cognitive Status (TICS) for cognitive testing in post-stroke subjects.

### Methodology

Subjects recruited from a stroke clinic and geriatric day hospital were assessed using the R-CAMCOG (a modification of the cognitive part of the Cambridge Examination for Mental Disorders of the Elderly, for use in stroke subjects) along with the TICS and a modified version, the TICS<sub>m</sub>. The order in which the tests were administered was randomised. A cut-off point of 33 on the R-CAMCOG was used to define post-stroke dementia.

### Results

Sixty four patients with a mean age of 72 were assessed. The Pearson Correlation Coefficient between the TICS and the TICS<sub>m</sub> and the R-CAMCOG were 0.833 and 0.855 (both  $p < 0.001$ ) respectively. Twenty four (38%) patients met R-CAMCOG criteria for post-stroke dementia. The area under the ROC curve for both the TICS and TICS<sub>m</sub> was 0.94. Using a cut-off of 28 or less on the TICS produced a sensitivity of 88% and a specificity of 85% for the diagnosis of post-stroke dementia. For the TICS<sub>m</sub> a cut-off of 20 or lower produced a sensitivity of 92% and a specificity of 80%.

### Conclusion

The TICS and TICS<sub>m</sub> telephone questionnaires are practicable and valid methods of assessing cognitive function in community outpatients following stroke.

## ASSOCIATION BETWEEN AGE, GENDER AND SUBTYPES OF STROKE

P.K. MYINT<sup>1</sup>, R.A. FULCHER<sup>1</sup>, E. JAVAHERI<sup>2</sup>,  
O. REDMAYNE<sup>1</sup>

Norfolk & Norwich University Hospital<sup>1</sup>, James Paget  
Hospital<sup>2</sup>

### Introduction

Epidemiological studies of demographic trends and disease show age and gender are independent risk factors for disease. We analysed the association between age and gender, and haemorrhagic and non-haemorrhagic stroke.

### Methodology

We used data from a stroke register in a UK District General Hospital, with a catchment population of approximately half a million. The numbers of stroke cases confirmed by CT scanning (average 72% of all stroke admissions) from August 1997- July 2001 were analysed. We looked at the association between type of stroke, gender and age banded for younger ( $\leq 75$ ) and older ( $> 75$ ) patients.

### Results

Age range = 18 – 105 years, median = 78 years.  
Male = 1132 (45.44%), female = 1359 (54.56%),  
ratio = 1: 1.2.

Table showing number of cases by age and gender

Type of stroke	Gender	$\leq 75$	$> 75$
Haemorrhagic	Male	107	69
	Female	79	109
Non-haemorrhagic	Male	476	480
	Female	371	800

In both age groups, there was no association between gender and type of stroke  $\chi^2_1 = 0.109$ ,  $p = 0.74$  for  $\leq 75$ , and  $\chi^2_1 = 0.104$ ,  $p = 0.74$  for  $> 75$ . There is an association between age and type of stroke ( $\chi^2_1 = 72.02$ ,  $p < 0.0001$ ), for both females ( $\chi^2_1 = 7.81$ ,  $p = 0.005$ ) and males ( $\chi^2_1 = 7.21$ ,  $p = 0.007$ ). A significant difference in non-haemorrhagic stroke between two age groups, 82.0% in  $\leq 75$  and 87.8% in the  $> 75$  (difference 5.8%, 95%CI: 2.9%, 8.7%), was observed.

### Conclusion

We conclude that older age is associated with a higher risk of non-haemorrhagic stroke. Younger males and older females have a higher risk of having haemorrhagic stroke.

## NOCTURNAL OXYGEN SATURATION AND COGNITIVE FUNCTION IN PATIENTS UNDERGOING REHABILITATION FROM ACUTE STROKE

M. HALIM AND C. ROFFE

Keele University, UK

### Introduction

Stroke patients perform worse in cognitive function tests than age matched controls. Nocturnal hypoxia is common after stroke and may affect daytime function. The aim of this study is to compare performance on cognitive function tests between stroke patients who are mildly hypoxic and those who are normoxic.

### Methodology

Stroke patients undergoing rehabilitation were recruited >2 weeks after symptom onset. Oxygen saturation (SpO<sub>2</sub>) was recorded by pulse oximetry (Minolta 3i) from 23:00 to 07:00. Cognitive function was assessed on the day after over night pulse oximetry using the Mini Mental State Examination (MMSE), the National Adult Reading Test (NART) and Trail Making A & B tests (TMA & TMB).

### Results

Patients were divided into two groups: Group 1: Hypoxic (mean nocturnal SpO<sub>2</sub> < 94%) and group 2: Normoxic (mean nocturnal SpO<sub>2</sub> ≥ 94%). Baseline characteristics were: mean age 72sd8 / 72sd8 years, 57% / 65% males, Body Mass Index 26sd6 / 24sd5, smokers 14% / 21%, snorers 43% / 44% for hypoxic and normoxic patients respectively.

	Hypoxic patients (n = 28)	Normoxic patients (n = 34)
Mean nocturnal SpO <sub>2</sub>	92 sd 1*	95 sd 1
4% oxygen desaturation index	14 sd 14*	7 sd 7
Time spent with SpO <sub>2</sub> <90% (minutes)	41 sd 40 *	9 sd 28
Barthel ADL	8 sd 3	8 sd 4
MMSE	27 sd 3	27 sd 4
NART	12 sd 8	7 sd 9
TMA (seconds)	169 sd 212	129 sd 96
TMB (seconds)	327 sd 301	298 sd 203

\*p < 0.05 (Student's t-test)

### Conclusion

Performance in activities of daily living and the MMSE was the same in both groups. There was a non-significant trend towards poorer performance in the hypoxic group in the vigilance tests (TMA and TMB).

## DEVELOPING A THROMBOLYSIS SERVICE FOR ACUTE ISCHAEMIC STROKE IN A UK DISTRICT GENERAL HOSPITAL (DGH): A FEASIBILITY STUDY

R. FREARSON, N. YOUSAF, I. WANDLESS, P. EARNSHAW

University Hospital of North Durham

### Introduction

The benefits of thrombolysis in acute ischaemic stroke have been established in randomised controlled trials, yet the uptake of this treatment has been slow in UK DGHs. Larger centres have published data reporting delay in arrival to hospital as a major limiting factor. We aimed to assess feasibility of offering thrombolysis from our existing practice.

### Methodology

All patients admitted to the medical admissions ward with suspected stroke in April 2003 were recruited prospectively. The source of admission and the times for onset of symptoms, arrival in hospital and medical assessment were recorded.

### Results

Fifty-eight patients mean age 75 (46–92) were recruited, representing 8.3% of all medical admissions. Twenty-six patients were admitted via Accident and Emergency, 29 from general practitioners and 3 from other sources. 52 (89.7%) were diagnosed with a possible or definite clinical stroke. A time of onset was available in 22 (37.9%) with a mean time to arrival of 7 h 29 m (31 m – 29 h 30 m). Nine were admitted within two hours, eight (88.9%) of which diagnosed with stroke. Two of these were also assessed within two hours, with one diagnosed with stroke. This patient had self-referred to the ward!

### Conclusion

Within one month, only one patient with a stroke arrived in hospital and was assessed within two hours from onset, potentially enabling a CT brain to be performed and thrombolysis initiated within three hours. In most cases, an estimated time of onset of symptoms to permit a clinical decision regarding thrombolysis was not available. The study highlights difficulties of applying evidence-based treatments within current UK medical practice, with a need for further broad-based service development.

## SEASONALITY & WINTER EXCESS OF STROKE ADMISSIONS

P.K. MYINT<sup>1</sup>, R.A. FULCHER<sup>1</sup>, E. JAVAHERI<sup>2</sup>,  
O. REDMAYNE<sup>1</sup>

Norfolk & Norwich University Hospital<sup>1</sup>, James Paget  
Hospital<sup>2</sup>

### Introduction

Cardiovascular, cerebrovascular and respiratory diseases have been shown to have seasonality in their incidence and mortality. We used data from a stroke register to look at the number of stroke admissions by month & season over a 5-year period.

### Methodology

We analysed the cumulative monthly admissions adjusted for the number of days in each month and the percentages of cumulative admissions per day from 1997–2001. We also looked for winter excess in the number of admissions by using Curwen's method\* [winter excess = {winter –  $\frac{1}{2}$ (summer + autumn) admissions}] from August 1997 to July 2001.

### Results

Age range; 18–105 (median = 78), N = 4456

Table 1 Cumulative monthly admissions, day adjusted number of admissions and percentages of admissions

Month	Cumulative total	Adjusted No of admissions (mean = 11.7)	% of mean
Jan	356	11.5	98
Feb	304	10.9	93
Mar	395	12.7	109
Apr	346	11.5	98
May	349	11.3	97
Jun	319	10.6	91
Jul	352	11.4	97
Aug	365	11.8	101
Sep	352	11.7	100
Oct	374	12.1	103
Nov	357	11.9	102
Dec	411	13.3	114

**Table 2**–winter excess in admission (1997/98 to 2000/01) over 4 seasonal years

Year	Autumn (Aug–Nov)	Winter (Dec–Mar)	Summer (Apr–Jul)	Winter excess*
1997–98	267	288	266	+ 21.5
1998–99	277	327	289	+ 44
1999–00	302	291	268	+ 6
2000–01	286	287	300	– 6

### Conclusion

Autumn and winter months generally had higher stroke admissions except January and February where lower than average admissions were observed. Using Curwen's method, we demonstrated winter excess in stroke admissions but this is highly variable and this suggests that there may be influences other than season.

## POOR OUTCOME IN PRIMARY INTRACEREBRAL HAEMORRHAGE: RESULTS OF A MATCHED COMPARISON

M. BARBER, G. RODITI<sup>1</sup>, D.J. STOTT AND  
P. LANGHORNE

Academic Section of Geriatric Medicine and  
Department of Radiology<sup>1</sup>, Royal Infirmary, Glasgow

### Introduction

Primary intracerebral haemorrhage (PICH) is associated with poorer outcome than cerebral infarction. We aimed to determine whether this poorer outcome is explained by stroke clinical severity.

### Methodology

An observational study of outcome in consecutive admissions with acute PICH and ischaemic stroke. A nested case control analysis, matched on a 1:2 basis for age, pre-stroke disability, early neurological impairment (Scandinavian Stroke Scale (SSS)) and Oxfordshire Community Stroke Project classification was then performed. Follow up was at 30 days and hospital discharge.

### Results

Six hundred and seventy nine subjects were included in the analysis. Fifty three (8%) had PICH; this group had a worse initial neurological impairment (day 3 SSS 28 v. 45 points,  $p < 0.001$ ) and a higher prevalence of total anterior circulation strokes (55% v. 21%,  $p < 0.001$ ) compared to ischaemic strokes. Outcomes were worse in the PICH group with 36% inpatient mortality and 68% of survivors having a day 30 modified Rankin Scale (MRS) of  $\geq 3$  (compared to 13% and 52% respectively in the ischaemic stroke group). Following matching for baseline characteristics the PICH group had a higher mortality but this was not statistically significant; the day 30 MRS and institutionalisation rates in survivors were similar in the matched haemorrhage and infarct groups.

### Conclusion

PICH is associated with high mortality and increased disability in survivors compared to ischaemic stroke. Severity of clinical stroke is a major contributor to these poor outcomes; baseline characteristics, however, do not fully explain outcome differences.

**PREVALENCE AND THE RISK  
FACTORS FOR ASPIRIN RESISTANCE IN  
A POPULATION-BASED STUDY OF PATIENTS  
WITH ACUTE VASCULAR EVENTS**

A.J. COULL, L.E. SILVER, P. HARRISON, H. SEGAL  
AND P.M. ROTHWELL FOR THE OXFORD  
VASCULAR (OXVASC) STUDY

*Stroke Prevention Research Unit, Radcliffe Infirmary,  
Oxford*

### Introduction

Aspirin reduces the risk of recurrent vascular events by 20–25% after ischaemic stroke and acute coronary syndromes (ACS). The anti-platelet properties of aspirin are not uniform between individuals and some appear to be aspirin resistant (AspR). There are no published data on the prevalence of AspR from population-based studies and few data on risk factors.

### Methodology

AspR was measured in patients with acute vascular events in a population of 90,542 in Oxfordshire as part of OXVASC. Citrated (3.2%) blood was tested with the PFA-100. This rapid assay passes whole blood through an aperture inducing sheer stress causing platelets to occlude the aperture. Aperture closure time (CT) is a measure of platelet activity. AspR was defined as the absence of a prolonged CT within a Collagen/Epinephrine (CEPI) cartridge (normal range = 79–164 seconds) in a patient taking regular aspirin (75–300mg).

### Results

Of 214 patients tested, 43 (20.3%) were AspR with no differences between types of vascular event: ischaemic stroke 20/87 (23%), transient ischaemic attack 8/49 (16%), ACS 13/67 (19%) and peripheral event 2/9 (22%). Older patients were more likely to be AspR: age <55 = 3.6%, 55–84 = 22%, >85 = 38.5% ( $p < 0.05$ ). The frequency of AspR increased with severity of ischaemic stroke (NIH score): relative risk = 5.2, 2.7–9.8 ( $p < 0.00001$ ) for NIH > 10 vs NIH ≤ 10. Increasing age and stroke severity were independently associated with AspR in multiple logistic regression analysis.

### Conclusion

20% of patients with acute vascular events may be resistant to aspirin. Increasing age and severity of stroke are independently associated with AspR. Further follow-up will determine whether AspR persists in the long-term after an acute event and whether it is predictive of an increased risk of recurrent events.

**RATES AND NON-FATAL ACUTE  
CEREBROVASCULAR VERSUS CORONARY  
VASCULAR EVENTS: IMPLICATIONS FOR  
PROVISION OF ACUTE SERVICES**

A.J. COULL, L.E. SILVER, P.M. ROTHWELL FOR  
THE OXFORD VASCULAR (OXVASC) STUDY

*Stroke Prevention Research Unit, Radcliffe Infirmary,  
Oxford*

### Introduction

The provision of services for acute assessment, investigation and treatment of TIA and acute stroke is much less than for acute coronary syndromes (ACS). ACS are a more common cause of death than stroke, but mortality data are a poor measure of the need for clinical services. Many deaths attributed to ACS occur suddenly in the community, and do not have a major impact on acute clinical services. Service provision should reflect rates of events that are not immediately fatal and that therefore require urgent management. We determined rates of all acute vascular events in all territories (TIA, stroke, ACS and peripheral arterial) that were non-fatal at the time of presentation to medical services.

### Methodology

The Oxford Vascular Study (OXVASC) is a prospective population-based study of all incident and recurrent acute vascular events in a pilot population of 90,542.

### Results

Between 1<sup>st</sup> April and 31<sup>st</sup> March 2002, 247 patients had an acute cerebrovascular event (89 with TIA and 158 with stroke) that was non-fatal at the time of presentation to medical services, 269 had a non-fatal ACS (113 with unstable angina, 103 with non ST-elevation MI and 53 with ST-elevation MI) and 33 had a non-fatal acute peripheral vascular event. The crude annual event rates were 2.73, 2.97 and 0.36 per 1000 respectively. In patients aged ≥ 65 years, rates were 14.8, 13.3 and 1.9 respectively.

### Conclusion

Mortality due to ACS is higher than that due to acute cerebrovascular events but rates of non-fatal events requiring acute assessment, investigation, treatment and secondary prevention are similar. Provision of acute services should reflect this.