

# Proceedings Belgian Stroke Council Meeting Liege, 28<sup>th</sup> September 2002

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**Dorsal Thalamic Haemorrhage Complicating Polyarteritis Nodosa : A clinico-pathologic case report and review of the literature.** J. DE REUCK (Department of Neurology, University Hospital, Ghent, Belgium).

Intracerebral haemorrhage is a rare complication of polyarteritis nodosa (PAN). We present the clinico-pathologic findings of a 62 year-old patient with systemic involvement by PAN, who developed temporary decrease of consciousness and a mild left hemisindrome due to a small right dorsal thalamic haemorrhage. No clear cause for the haemorrhage was found on postmortem examination.

The patient fulfilled the criteria of PAN of the American College of Rheumatology but not of the Chapel Hill Consensus Conference, who would had classified this case as microscopic polyangiitis (MPA), due to the presence of glomerulonephritis. Arguments for a classical PAN are that biopsy and autopsy revealed only necrotizing inflammation of medium-sized or small arteries, without involvement of arterioles, capillaries and venes. Also the fact that the patient had a prior history of hepatitis points to an association with PAN.

As described in the literature temporary decreased consciousness and mild transient motor deficit were the main clinical features of the small dorsal thalamic haemorrhage in our case.

No vasculitis lesions or microaneurysms were found in the brain of our patient, despite still active lesions in other organs. Also no fibrotic thickening as remnant of healed vasculitis lesions of the deep perforating arteries were observed. Some atherosclerotic mechanism, induced by corticosteroids alone or combined with cyclophosphamide or azothioprine has been suggested rather than the vasculitic arterial changes to explain the late occurrence of strokes in treated patients with PAN. In this case, however, no direct cause for the thalamic haemorrhage was found.

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**Lipids and Ischemic Stroke Subtypes.** P. LALOUX, L. GALANTI, J. JAMART (Departments of Neurology, Medical Laboratory, and Biostatistics, Mont-Godinne University Hospital, Yvoir, Belgium).

Hyperlipidemia as a risk factor for stroke remains controversial. Few studies have assessed the relationship between the lipids and ischemic stroke subtypes.

Two hundred and forty consecutive patients (92 women, 148 men ; mean age,  $66.2 \pm 11.9$  years) selected as having only one stroke mechanism were prospectively studied. The levels in total cholesterol (Total-C), LDL-cholesterol (LDL-C), HDL-cholesterol (HDL-C), and triglycerides (TG) were compared between the patients with a large vessel disease (LVD, n = 61), small vessel disease (SVD, n = 65), cardioembolism (CE, n = 114) and age and sex matched controls. Analysis was performed after adjustment for the other risk factors. The three groups were not significantly different for age, sex, diabetes, and alcohol intake. However, hypertension was more frequent in SVD than in CE stroke ( $p = 0.013$ ) and smoking in LVD than in SVD ( $p = 0.033$ ) and CE stroke ( $p < 0.001$ ). Compared to controls, the mean Total-C level was significantly increased in SVD ( $p < 0.01$ ) and LVD ( $p < 0.05$ ). A significant increase of the mean level in LDL-C ( $p < 0.01$ ) and decrease of that in HDL-C ( $p < 0.01$ ) were only observed in LVD patients. The three stroke subtypes showed higher levels in TG compared with controls (CE stroke,  $p < 0.05$  ; SVD,  $p < 0.001$  ; LVD,  $p < 0.05$ ). The plasma lipid profile was similar in the SVD and LVD subtypes except for HDL-C, which was significantly lower in patients with LVD than SVD ( $p = 0.047$ ). A logistic regression adjusted for confounders showed that decreased HDL-C ( $p = 0.020$ ), male gender ( $p = 0.074$ ), and smoking ( $p = 0.008$ ) were significant risk factors of LVD vs. SVD.

In conclusion, this controlled study shows that hypertriglyceridemia is commonly found in ischemic cerebrovascular disease whatever the stroke subtype, whereas hypercholesterolemia is more related to SVD and LVD. In addition to hypertension or diabetes, SVD can be due to hypercholesterolemia but differs from LVD by a lower decrease of HDL-C.

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**A comparison of percutaneous PFO closure and antithrombotic therapy after cerebral ischemia due to presumed paradoxical embolism.** M. SCHROOTEN, W. BUDTS, V. THUIS (Department of Neurology and Cardiology, UZ Gasthuisberg, Katholieke Universiteit Leuven, Belgium).

The optimal measure to prevent recurrent stroke after cryptogenic cerebral ischemia associated with PFO is currently unknown. Percutaneous closure of the PFO is increasingly advocated although no randomized trials have been performed. The goal of our study was to evaluate the long-term risk of recurrent thromboembolic events in patients with PFO and paradoxical embolism treated with antithrombotic agents or percutaneous PFO closure.

*Methods* : We performed a chart review and telephone interview to assess the rates of recurrent TIA/stroke among patients with PFO and cryptogenic cerebral ischemia admitted to the Neurology and Cardiology departments at our institution between 1997 and 2001. The primary endpoint of the study was recurrent stroke and the secondary endpoint was recurrent TIA or stroke during follow-up. Recurrence rates were analysed using survival analysis and comparisons among both groups with the log-rank test.

*Results* : One hundred twenty one patients had cerebral ischemia associated with a PFO during the study period. In 34 patients (28%) another potential etiology for cerebral ischemia was found. This left 87 patients (72%) with cryptogenic cerebral ischemia and a PFO. Percutaneous closure was performed in 49 patients (56%) and 38 patients (44%) were treated with antithrombotic therapy (antiplatelet agents, 92%, oral anticoagulants 8%). The mean follow-up was 1.9 years. Patients who underwent PFO closure were younger (mean 48 years versus 58 years,  $p = 0.002$ ) and more frequently had migraine (38% versus 16%,  $p = 0.05$ ), but had an otherwise comparable cardiovascular risk profile. The recurrent stroke rate was 1.35% per patient year in medically treated patients treated compared to 0% in patients who underwent PFO closure ( $p = 0.26$ ). The recurrent stroke/TIA rate was 4.13% per patient year in medically treated patients compared to 0% in patients who underwent PFO closure ( $p = 0.04$ ).

*Conclusion* : There was no difference in the rate of recurrent stroke in both groups, although the higher frequency of recurrent TIA or stroke in medically treated patients suggests a protective effect of PFO closure. This needs confirmation in long-term randomized controlled trials.

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**Diagnostic and therapeutic impact of ambulatory electrocardiography in acute stroke.** E. VANDENBROUCKE, V. N. THYS (From the Department of Neurology (EV, VT) and Internal Medicine (EV), UZ Gasthuisberg, Katholieke Universiteit Leuven, Belgium).

*Objective* : To assess the diagnostic and therapeutic impact of adding ambulatory electrocardiography (24 hr ECG) to a standardised ischemic stroke workup.

*Background* : Detection of paroxysmal atrial fibrillation (PAF) in patients with recent ischemic stroke or TIA suggests a cardioembolic etiology and leads to initiation of oral anticoagulation in suitable candidates.

*Methods* : We retrospectively assessed consecutive stroke patients in whom 24 hr ECG was obtained together with a standardised stroke diagnostic workup. We measured the frequency of detection of PAF on 24 hr ECG that was not diagnosed clinically or on a standard 12-lead ECG. The diagnostic impact of 24 hr ECG was compared with that of carotid ultrasound by assessing how often this test lead to perform a carotid endarterectomy or stenting of the carotid artery.

*Results* : One hundred forty five ischemic stroke patients were included. 24 hr ECG was obtained in 136 patients (93.8%). Clinically unsuspected PAF was detected on 24 hr ECG in 7 patients (5.1%). The secondary prevention measure changed from antiplatelet agents to oral anticoagulation in 6 of 7 patients. Carotid duplex examination was performed in 142 patients (98%). A high-grade (> 70%) stenosis of the ipsilateral carotid artery was found in 6 patients (4.2%). Five patients underwent a carotid intervention.

*Conclusion* : 24 hr ECG increases the detection of previously unknown PAF. This often alters the etiologic classification of stroke and leads to a change in antithrombotic therapy. Our findings suggest that ambulatory electrocardiography is a valuable diagnostic tool in the workup of stroke patients.

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**Economic study of acute stroke care in a Belgian Center.** K. CLAEYS, P. CRAS (Department of Neurology, University of Antwerp (UIA), Antwerp, Belgium).

*Background* : In the context of demographic changes and the increasingly cost-conscious environment of hospital care, it is necessary to deliver both a qualitative and efficient care for the acute stroke patient.

*Objective* : The goal of our study was, first, to characterize the population of acute stroke patients, and to evaluate the current stroke care in the University Hospital Antwerp (UZA). Second, we studied the possibilities to improve the care of acute stroke patients in our center.

*Methods* : We performed a retrospective study over a time period of six months (10/98-03/99). Inclusion criteria were patients with the diagnosis of Transient Ischaemic Attack (TIA), Reversible Ischaemic Neurologic Deficit (RIND), Ischaemic Cerebrovascular Accident (ICVA), or Intracerebral Hemorrhage (ICH), who were admitted on the general ward of neurology (20 beds, no Stroke Unit) in our hospital (573 beds) during the study period.

*Results* : The total number of patients was 63, with a mean age of 67.5 years [36-92]. There were slightly more male patients (55.6%). The majority of the patients had a diagnosis of ICVA (61.9%), followed by TIA (25.4%), RIND and

ICH (6.3% each). Patients were mainly referred by their general practitioner (42.9%), one third presented on their own initiative (30.2%), 11.1% was referred by another hospital and 9.5% by another department of the UZA. The hospitalization concerned the first contact with the UZA in 41.3% of the cases. The mean time interval from symptom onset until arrival at the hospital was 12,5 hours. This large time interval is also reflected by a low number of patients that were treated with thrombolysis (1.7%). The mean length of stay (LOS) for all diagnostic groups was 13.7 days. In case of discharge to a rehabilitation center (resident ; 7.9%) or to a geriatric department of another hospital (6.3%), mean LOS was 36.4 and 28.0 days respectively. The key interventions (= performed in at least 80% of the patients) were a laboratory investigation, electrocardiography, chest X-ray, cranial CT-scan, and transthoracic echocardiography. Overall, a considerable variability in type and timing of investigations was observed. A cost-effectiveness analysis for a Stroke Unit (3 beds) on our ward showed that the costs were much higher compared to the direct revenues. However, the many important advantages and indirect revenues of a Stroke Unit have also to be taken into account.

*Conclusion* : We can conclude that there were three main problems in the current acute stroke care : a long time interval until admission at the hospital, a considerable delay in discharge to rehabilitation centers and other hospitals, and a lack of standardized approach to stroke care. A Stroke Unit and the implementation of a multidisciplinary care plan are necessary to provide well-organized, high-qualitative and efficient care for acute stroke patients.

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**Cerebral ischemic stroke and methadone.** V. CALOMNE, M. DUPUIS, Ph. JACQUERYE, Ph. BOSSCHAERT, Ch. REYNAERT (Department of Neurology, Radiology, and Psychiatry, Clinique Saint-Pierre, Ottignies, Belgium).

We report the case of a drug addict who was substituted orally by methadone. He used to dissolve the methadone capsules and then inject them intravenously through the jugular vein. After a probable carotid injection, the patient developed a massive ischemic MCA stroke. The practitioner must consider the risk of intravenous injection with its possible ischemic complications when prescribing methadone.

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**Deep cerebral venous thrombosis and isolated headaches : a case report.** M. GILLE<sup>1</sup>, D. CROMBÉ<sup>2</sup>, F. HAVEN<sup>2</sup> (<sup>1</sup>Departements of Neurology and <sup>2</sup>Clinical Imaging, Cliniques de l'Europe, Site Sainte-Elisabeth, Brussels).

Deep cerebral venous thrombosis (DCVT) is usually considered as a rare vascular disorder with poor prognosis. However, some cases of DCVT may have a favourable outcome. We report the case of a 46-year-old woman who developed headaches as the sole manifestation of DCVT. She did not have any vascular risk factor, except for the use of oral contraceptive agents. The neurological examination, the EEG, and the coagulation tests were unremarkable. The cranial CT revealed a right thalamic hypodensity, in addition to a "cord sign" at the site of the vein of Galen. The MRI showed a thrombosis of the vein of Galen, with extension to the internal cerebral veins, and without dural sinus involvement. The DCVT was associated with right thalamic and left capsulo-lenticular vasogenic edemas. The thalamic lesion had a haemorrhagic component. T1 enhanced images also revealed a venous congestion of the subependymal plexus and the medullary veins that run perpendicular to the wall of the lateral ventricles. The oral contraception was discontinued and she was given oral anticoagulants during 6 months. The clinical outcome was characterized by a persistent fatigue, intermittent paresthesias and thalamic pain in the left arm, and a progressive disappearance of the headaches. The sensory symptoms responded partially to carbamazepine and clonazepam. The sequential MRI examinations demonstrated a rapid resolution of the vasogenic oedema and a progressive recanalization of the deep cerebral veins. This case illustrates the typical CT and MRI findings in DCVT, and the fact that some cases of DCVT may have a benign course.

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**Isolated Cerebral Vasculitis, a disease often misdiagnosed as cryptogenic strokes. Clinical presentation, diagnosis, treatment and follow-up of 6 cases.** K. PEDERSEN, S. JEANETTE, N. MAVROUDAKIS, Ph. LESPLINGARD, N. FARKASEVIC, S. BLECIC (Stroke Unit, Department of Neurology, Erasme Hospital).

*Background and aim of the study* : Cryptogenic stroke is generally defined by a stroke without any risk factors and in which the aetiology remains unknown despite extensive work-up. Isolated cerebral arteritis (ICA) is a disease exclusively confined to the central nervous system, consisting with small and middle-size cerebral arteries involvement and leading to recurrent neurological symptoms such as stroke like episodes, cognitive decline and death. Frequently multi focal neurological signs are found and headaches are a hallmark of the clinical presentation. Up to now, few series have been extensively described in the literature. The aim of the study was to better define the clinical patterns, treatment and to assess the follow-up of these patients.

*Patients and methods* : All patients (pts) admitted to the neurological department between January 1991 and September 2002 for suspicion of ICA, were prospectively assessed. All had had extensive stroke work-up including cardiac investigations and complete coagulation study. Additionally, they also had a complete auto-immune work-up and a CSF examination. On the results of this first work-up they either had catheter cerebral angiography and/or brain lesion biopsy.

*Results* : From 12,314 pts admitted to the neurological department, 4,012 were admitted for a stroke. After complete work-up 63 pts were diagnosed as having cryptogenic stroke and 6 met the criteria for ICA. All had an initial clinical presentation of acute ischemic stroke. All had a negative stroke work-up and 5/6 had anomaly on CSF examination. 4/6 pts had catheter angiography. This examination allowed to diagnose ICA in 1 patient only. In the remaining 5 pts diagnosis was confirmed only after brain biopsy. All pts were treated with a combination of methyl-prednisolone and immuno-suppressive treatment. Long-term follow-up has been available for the first four pts. Neurological improvement was observed in all and none had recurrence.

*Conclusion* : ICA is a rare condition accounting for 0,04% of all neurological admissions and for 0.15% of all strokes. Clinical presentation of stroke like episode may wrongly suggest the diagnosis of cryptogenic stroke. Brain biopsy is frequently necessary to confirm the diagnosis and immuno-suppressive treatments are effective to prevent neurological deterioration or recurrence.

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