News Letter

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From the Editor's desk

I wish all our readers a very Happy Independence Day. Sixty four years have gone, still, our great nation has to live up to the expectations of we the people. This is the storey of our different government, and non-governmental and also Scientific Societies. During the inception of our society we had taken so many vows and pledges to make our society a dynamic, robust and vibrant. What happened to those? Whatever gone has never returned! Lets take the most important pledge which all our members were unanimous. Lets try sincerely to fulfill the pledge and try to achieve that goal.

The foremost being to have a journal of our own. This is not a Herculean task for us. We can however, have our own if all our members follow my little advice. One thing the members have to do is to submit their scientific observations and interesting case reports to our Editorial office for publication in our "News Letter". Please, for Heaven's shake brood over this advice of mine time and again and act positively.

In this issue, we have published an interesting experimental study carried out at Soroka Medical Centre, Ben Gurion University, Beer Sheva, Israel. I am highly thankful to Prof. P.K. Bithal, for reviewing the manuscript and above all, writing the editorial. His "Editorial", I am sure, will act as a tonic for our young members and may stimulate some of our Head of the department to open up the basic science research facilities in their department.

*The 2nd Conference of Asian Society for Neuroanaesthesia and Critical Care & **12th Annual Conference of Indian Society of Neuroanaesthesiology and Critical Care"** is to be held at Habitat Centre located at the heart of New Delhi. May I request all our members to register for the conference and try to reap the scientific harvest which our scientific committee is preparing. This time we are planning to have good reward for the scientific posters. I would request all our young and budding members of our society to compete with their colleagues from Japan, Korea, Taiwan, China, Indonesia and grab the lime light.*

*Like our previous conferences lets make this **"2nd Conference of Asian Society for Neuroanaesthesia and Critical Care & 12th Annual Conference of Indian Society of Neuroanaesthesiology and Critical Care"** a great success and memorable one.*

H.H. DASH
Editor-in-Chief

"EAST OR WEST CLINICAL EXAMINATION SHOULD BE THE BEST"

It is extremely essential to assess the severity of neurological insult resulting from any pathology. This initial neurological injury not only determines the prognosis in the long run , but also dictates the nature of therapy to be instituted in the initial stage of patients' presentation. Umpteen indices have been described in literature to determine the severity of neurological injury, i.e.; Glasgow Coma Score (GCS) for head injury, Barthel Index for stroke, Hunt and Hess grading for subarachnoid hemorrhage etc, to name a few popular ones. In this issue of News Letter, Zlotnek and colleagues have highlighted some extraneous factors which may mimic neurological injury and, therefore, at times mislead a clinician to institute therapy which might turn out be unwarranted at a later stage when influence of these extraneous factors is abolished.

It is a common observation that in presence of injury or presence of vascular line in a limb (especially when the line is inserted into ante cubital fossa or groin vein) ,the patient has tendency not to or minimally move that limb because any movement in such scenario brings about pain. This decreased movements may be perceived as neurological deficit, even if the patient has suffered from some kind of trivial neurological insult without any deficit. Similarly, under such circumstances a mild grade of neurological deficit may be misconstrued as moderate grade deficit and thereby leading the clinician to a wrong direction. Zlotnek and colleagues have brought out these factors explicitly in their experimental study. Rats who had vascular lines placed in femoral vessels exhibited false positive neurological injury at various time intervals compared with rats in whom the vascular line/s were not inserted in these vessels. The former group of rats were observed with higher neurological severity score (NSS) compared with the later group. It is authors' advise to all concerned clinicians to be wary of such confounding factors while dealing with neurological patients with intravenous or intraarterial cannulations. The neurological assessment scale (NSS) described by Shapira et al.,1 is suitable for experiment in animals only and is considered to correlate closely with histological and biochemical markers of severity of brain injury, as well as long term neurological recovery. Their observations may be true for animal model but to apply them clinically is probably a far-fetched expectation. Furthermore, in clinical practice ante cubital vein or femoral vessels are not popular anatomical sites for vascular lines placement. Also a good clinician is unlikely to overlook the contribution of these confounders .

While appreciating the authors for highlighting confounder in day to day clinical practice, I wish they should have refrained from dividing the study into seven groups, because analysis of data of a study with so many groups becomes very complex. Furthermore, readers find it difficult to comprehend .The authors should have avoided two groups where vascular lines were placed in rats' tail because these groups are more or less akin to the sham group (authors have included a sham group too). Also there is no difference between group 6 and 7 and thus there was an opportunity for the authors to further reduce the number of groups. Moreover, Rat tail movement is used to analyze the effectiveness of an analgesic drug before its introduction into clinical practice. But, its movement to determine neurological deficit has no relevance in humans for the obvious reasons.

I fervently hope authors' work would stimulate inquisitive minds to refine the research in this field keeping an eye on the various lacunae out lined in this study.

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Arterial and Venous Catheter Position Significantly Influences Neurological Assessment in Rats

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Introduction: Several motor-function scales have been developed to assess neurological function in animal models of stroke, subarachnoid hemorrhage, and closed head trauma. External factors may influence an animal's motor function, irrespective of the severity of brain insult, and may thus confound the results of an experiment. We hypothesized that the location of arterial and venous catheters, even in the absence of brain injury, may impact rats' motor performance.Main aim of our study is to examine the effect of catheter location on motor function. In addition, we studied the incidence of infection, resulting from catheter placements and the time required for catheter cannulation at different anatomical locations.

Materials and Methods: Sixty one rats were anesthetized and randomly assigned to one of seven groups : no catheter, tail artery or artery + vein catheters, or femoral artery or artery + vein catheters. Catheters were removed at either 1 h or 48 h. A neurological severity score (NSS) was determined at 1 h, 24 h, and 48 h after surgical preparation or catheter placement. Rats were examined for the presence of catheter site infection every 24 h during the first five days after the lines were placed.

Results: The NSS measured at 1 h was significantly higher in the femoral artery group (6, range 3-9; $p<0.001$), femoral artery + vein group with 48 h removal (6, range 4-8; $p<0.001$), and femoral artery + vein group with 1 h removal (6, range 4-8; $p<0.001$) in comparison to the control group. But, the NSS observed at 24 h was higher in the femoral artery + vein group with 48 h removal (3, range 2-5; $p<0.05$). The time required for the insertion of femoral catheters was significantly longer compared with the time spent for the insertion of tail catheters (P-value <0.0001). The incidence of catheter site infection was significantly higher in the groups that had femoral catheters placed.

Conclusion: The location of arterial and venous catheters influences the NSS in rats, even in the absence of actual neurologic injury. The placement of femoral catheters led to a significant increase in NSS compared with rats who received tail catheters.

Animal models have provided useful insights into the pathophysiology of stroke, subarachnoid hemorrhage and closed head trauma (CHT), and have played an important role in the development of treatment modalities 1-5. To determine treatment outcomes, several motor-function scales have been developed to quantitatively evaluate the neurological status in rats after stoke 6-12, subarachnoid hemorrhage13, 14 and CHT 2, 15, 16. One such scale, the neurological severity score (NSS), has been demonstrated to correlate closely with histological and biochemical markers of the severity of brain damage, as well as long-term neurological recovery 2, 6, 16-19.

One potential factor that may influence the NSS is the anatomical location of the vessel in which arterial and/or venous catheters are placed. In experiments where the NSS is measured, there are currently no guidelines that dictate which vessels should be used for catheter insertion. A review of literature revealed that femoral 3-5, 15, 20-24 and tail 6, 16, 25-27 artery and vein are the most common sites of catheter insertion in animal models of stroke and CHT. In some studies, both tail and femoral catheters were utilized simultaneously in the same experiment16.

Another potential factor that may influence the NSS is the presence of infection at the site of catheter placement. Infection rates may vary depending upon location of vascular lines. The presence of infection, even if local, may influence an animal's state of well-being, behavior, and may necessitate prophylactic administration of antibiotics. Additionally, the time necessary to prepare animals for an experiment is also important. A longer preparation time

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may require a larger cumulative dose of anesthetic. In turn, the dose and type of anesthetic may alter the various measured parameters, including heart rate, blood pressure, cerebral blood flow and cerebral metabolic rate. Alteration in there vital parameters may have influence on neurological outcome. More importantly, many general anesthetics currently used for animal anesthesia have been demonstrated to exhibit neuroprotective properties in animal models of different kinds of brain insults26, 28. Therefore, time necessary to prepare animals for an experiment is of paramount importance.

We hypothesized that pain at the catheter insertion site, surgery-related nerve or muscle injury, and the presence of a foreign body (that is., artery and/ or vein catheter) may affect the ability of rats to perform motor tasks. As such, the location of a catheter may affect the NSS and confound the results of an experiment. The purposes of this study were to investigate (1) whether the position of an arterial or venous catheter, even in the absence of brain injury influences the NSS, (2) infection rate at the site of catheter placement, and (3) time required for catheter placement at various anatomical sites

Materials and methods

The experiments were conducted according to the recommendations of the Declarations of Helsinki and Tokyo and to the Guidelines for the Use of Experimental Animals of the European Community. The experiments were approved by the Animal Care Committee of Ben-Gurion University of the Negev. Rats were kept in 12/12 hours light/dark circle for at least three days prior to the study. Free access to food and water was allowed for the duration of the experiment. Spontaneously-breathing, male Sprague Dawley rats (n = 61) weighing 300-350 g, were anesthetized with isoflurane (initial inspired concentration 2%) in 100% oxygen (1l/min). The rectal temperature was maintained at 37°C using a heating pad and anesthesia was considered sufficient for incision or catheter placement when the tail reflex was abolished.

Rats were randomly placed in one of 7 groups: (1) sham (no incision no catheter), (2) control (incision only), (3) tail artery catheter, (4) tail artery and tail vein catheters, (5) right femoral artery catheter, and (6 and 7) femoral artery catheter on one side and femoral vein catheter on the opposite side (that is., bilateral catheters). In groups 3-6 catheters were removed at 48 h whereas in group 7 catheters were removed at 1 h. There were eight to ten rats in each group (Table 1).

All catheters were placed by the same investigator, who was equally experienced in the placement of catheters in femoral and tail arteries and veins. The time interval measured from the beginning of catheter placement until suturing (for femoral catheters) or dressing placement (for tail catheters) was recorded. After the catheters were placed, anesthesia was discontinued and the rats were returned to their cages. Rats woke up in their cages with free access to food and water.

Table 1

Neurological Severity Score in each group (Median and range)

Group	Number of Rats Per Group	NSS at 1h	NSS at 24h	NSS at 48h	P-value (Compared to control at 1h)
Sham	8	0	0	0	
Control (incision only)	8	2 (0-3)	1 (0-1)	0 (0-1)	>0.05
Tail artery cannulation	9	0 (0-1)	0 (0-1)	0 (0-1)	>0.05
Tail artery + vein cannulation	10	0 (0-1)	0 (0-1)	0 (0-1)	>0.05
Femoral artery unilateral cannulation lines removed at 48 h	10	6 (3-9)**	2 (2-3)	1 (0-2)	<0.01

Femoral artery + vein lines bilateral cannulation removed at 48 h	8	6 (4-8)$$$	3 (2-5)=	0 (0-1)	<0.001
Femoral artery + vein lines bilateral cannulation removed at 1 h	8	6 (4-8)###	0 (0-1)	0	<0.001

NSS = Neurological Severity Score

** P < 0.01 compared with tail catheter groups
$$$ P < 0.001 compared with tail catheter groups
P < 0.001 compared with tail catheter groups
= P < 0.05 compared with tail artery group

Neurological Severity Score (NSS)

The motor score assesses mobility, reflexes, and function. The NSS, originally designed by Shapira and colleagues 2, was determined by a blinded observer. Points are assigned for alterations of motor functions and behavior, such that the maximal score of 25 represents maximal neurological dysfunction whilst a score of 0 indicates an intact neurological condition (Table 2). Specifically, the following were assessed: ability to exit from a circle (3 point scale), gait on a wide surface (3 point scale), gait on a narrow surface (4 point scale), effort to remain on a narrow surface (2 point scale), reflexes (5 point scale), seeking behavior (2 point scale), beam walking (3 point scale), and beam balance (3 point scale). The NSS was determined at 1 h, 24 h, and 48 h after the placement of the arterial and venous catheters.

Table 2

Neurological Severity Score

Mobility

Inability to exit from a circle (50 cm in diameter) when left in center	
Within 30 min	1
Within 60 min	1
>60 min	1
Hemiplegia (inability of rat to resist forced changes in position)	1
Inability to walk straight when placed on floor	1
Inability to move	1

Reflexes

Flexion of hind limb when raised by the tail	1
Loss of startle reflex	1
Loss of righting reflex	
For 20 min	1
For 40 min	1
For 60 min	1

Behavior

Loss of seeking behavior	1
Prostration	1

Functional tests

Failure at beam-walking task (1.5 cm wide)

8.5 cm wide	1
5.0 cm wide	1
2.5 cm wide	1
Failure at beam-balancing test (1.5 cm wide)	
For 20 s	1
For 40 s	1
For 60 s	1
Stability on beam balance (1.5 cm wide)	
Able to walk, normal gait	0
Able to walk, impaired gait	1
Unable to walk, steady balance on beam	1
Unable to walk, unsteady balance, all limbs on beam	1
Unable to walk, unsteady balance, unable to place all limbs on beam	1
Effort on beam balance (1.5 cm wide)	
Unable to stay on the board	1
Unable to try to stay on the board	1
Maximal score	**25**

Assessment of Wound Infection Complications

All rats were assessed for the appearance of local wound infections at the site of incision and catheter placement every 24 h during the first five days after placement (for two days with the catheters in place, and for three additional days after the catheters were removed). Wounds were considered infected when external mechanical pressure applied on the surrounding tissue caused extrusion of purulent material from the wound. This assessment was well tolerated by the animals and did not require the use of any additional anesthesia.

Removal of Catheters

In every group except group 7 in which the catheters were removed at one hour after the first neurological assessment, the catheters were removed at 48 h (after the third neurological assessment). This procedure required anesthesia for about five minutes for each rat. The sutures securing the catheter were cut, and the plastic catheter was removed. When necessary, one additional suture was applied to the skin margins to maintain the wound walls. If no bleeding was detected during the removal of the catheter, no additional interventions were necessary to control it.

Statistical Analysis

It was hypothesized that the NSS measured in rats with femoral catheters would differ from the NSS observed in rats with tail catheters or no catheters. Accordingly, this comparison was made with a two-tailed t-test. The significance of comparisons of the NSS between groups was determined using the Kruskal-Wallis test followed by the Mann Whitney U-test. Data are presented as median and range. Times required for placement of the lines were compared with a non-paired t-test. Data are presented as mean ± standard deviation. The differences were considered significant for both parametric and non-parametric values when $P<0.05$.

Results

The differences in NSS between the different groups are shown in Table 2. There were no differences in NSS between the sham group, control group, and both tail catheter groups at 1 h, 24 h, and 48 h. Compared with the NSS observed in the control group (0, range 0-1), the NSS measured at 1 h was significantly higher in the femoral artery catheter group (6, range 3-9; $p<0.01$), femoral artery + vein group with 48 h removal (6, range 4-8; $p<0.001$), and femoral artery + vein group with 1 h removal (6, range 4-8; $p<0.001$). Compared with the control group, the NSS observed at 24 h was higher in the femoral artery + vein group with 48 h removal (3, range 2-5; $p<0.05$). There were no significant differences in NSS observed between the tail artery groups and the other groups at 24 h or 48 h. No significant differences were observed between the three femoral catheter groups at 1 h, 24 h, or 48 h.

The times required for insertion of catheters are summarized in Table 3. The time necessary for the insertion of femoral arterial catheters was significantly longer compared with the time necessary for the insertion of tail catheters (P-<0.0001). Similarly, the time necessary for the insertion of femoral venous catheters was significantly longer than in the tail groups ($P<0.0001$). These observed differences were more pronounced for arterial catheters than for venous catheters.

Table 3

Times required for insertion of catheters

	Tail artery (N=19)	Femoral artery (N=26)	Tail vein (N=10)	Femoral vein (N=16)
Mean time (min)	6.5	17.4 ****	3.5	12$$$$
Standard deviation	3.1	2.3	1.4	1.6

**** P <0.0001 compared to tail artery catheter insertion

$$$$ P<0.0001 compared to tail venous catheter insertion

The incidence of local infections was significantly higher in the groups that had femoral catheters. Eight of 42 femoral insertion sites were infected. Every case of infection was detected at 48 hours after catheter insertion. In one rat, the infection was in both sides. After the removal of catheters at 48 hours after insertion, no new infectious complications were detected. No infections were detected in the sham group (incisions in the femoral region only) nor was any infection detected in the femoral group in which the catheters were removed at one hour after insertion. Complications due to infection were not observed at the insertion site where tail catheters were in situ.

There were no ischemic or hemorrhagic complications in the extremities or tail detected in any of the animal in any groups.

Discussion

Various neurological function scales have been used in the literature to objectively quantify the neurological status after stroke or CHT in rats 2, 6-12, 15, 16 and humans 29. Because the score on the neurological function scale is used to quantify the degree of brain damage, there is obvious importance in reducing any external factor/s that may impact the score. In this study we examined whether the location of catheter significantly impacted the NSS in rats. The principal findings were that the NSS at 1 h after placement of unilateral and bilateral femoral catheters was higher (indicating worse neurological status) than the NSS observed at 1 h after placement of tail arterial and venous catheters. The NSS was also significantly higher at 24 h in the bilateral femoral catheter groups as compared with the tail catheter groups. There were no differences in the NSS observed between the groups that had tail catheters and the sham group at 1 h, 24 h, or 48 h.

In experiments in which femoral catheters are placed, it is commonplace to insert a venous catheter in one leg and arterial catheter in the other leg 20-22. As such, there was importance in investigating whether there are any differences in NSS observed between the group that received a unilateral femoral arterial catheter, bilateral femoral catheters that were removed at 48 h, and bilateral femoral catheters that were removed after 1 h. We found no differences between the 3 groups.

Both pain and the presence of a foreign body may affect the ability of rats to perform motor tasks. In the control group, in which a bilateral femoral incision was made but no catheter was placed, there was no impact on NSS. Those results suggest that the presence of a foreign body might play a bigger role in affecting the rats' ability to perform motor tasks than pain after the insertion of a femoral catheter.

The incidence of wound infection at the site of catheter placement was significantly higher in the femoral catheter groups compared to tail catheter groups. There were no infections noted in the tail catheter groups. The risk of infection necessitates antibiotic prophylaxis, and the administration of antibiotics may have undesirable sequel. For example, many antibiotics have been reported to increase the number of glutamate transporters in the brain. This in turn may increase the elimination of excess glutamate from the brain after brain insult, which may decrease glutamate-induced neurotoxicity and influence the results of the experiments30. Infections were noted to develop only when catheters were left in place for 48 h. Most likely, the presence of a foreign body (cannula) in the femoral area may influence the integrity of the wound and may predispose to infection. The results of our experiments demonstrate that femoral catheters do not predispose to infection if removed during the first hour after placement.

The time required for the insertion of femoral arterial catheters was almost three times longer than for tail arterial catheters. The time required for catheter placement in femoral veins was almost four times longer than that for tail veins (Table – 3). A longer surgical preparation time may affect experimental outcomes. For example, a longer procedure time requires a greater cumulative dose of anesthetics to maintain adequate anesthesia. Different anesthetics may influence the various parameters measured in an experiment, including blood pressure, heart rate, cerebral blood flow, and cerebral metabolic rate. All these parameters have been shown to influence the neurological outcome. Perhaps more importantly, many different general anesthetics that are routinely used for animal anesthesia have been shown to possess neuroprotective properties in animal models of different kinds of brain insults26, 28.

The time necessary for insertion of tail catheters is much shorter, and there is no bleeding, no need for skin suturing, and no need for analgesia because the puncture is much less painful than an incision. Rats' performance of motor and behavioral tasks is sensitive to external factors, and may easily be influenced by pain. In addition to percutaneous cannulation of tail vessels affecting outcome, there are ethical considerations as well. Experimental methods that reduce any unnecessary pain and suffering of animals should be encouraged and utilized. Although percutaneous cannulation requires experience to perform quickly and with a high success rate, there is obvious value in learning this method of line placement.

Conclusion

The location of arterial and venous catheters influences the NSS in rats, even in the absence of stroke or CHT. The placement of femoral catheters led to a significant increase in NSS (worse neurological status) compared with rats who received tail catheters. There was no difference in NSS observed between the rats who received tail catheters and the sham group. To minimize any external factors that may bias the results of an experiment, the authors recommend that femoral catheters be avoided in future studies in which the NSS of rats is to be measured.

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CEREBRAL INFARCTION IN ACUTE ANEMIA

Tsai CF, Yip PK, Chen CC, Yeh SJ, Chung ST, Jeng JS.

J Neurol. 2010 Jul 16.

Abstract

There are few previous studies on the relationship between cerebral infarction and acute anemia. This study presents patients with cerebral infarction in acute anemia due to marked blood loss and aims to clarify the stroke nature and possible mechanism. Patients with acute cerebral infarction and anemia following marked blood loss without systemic hypotension were recruited from 2001 to 2009. Clinical characteristics, particularly hemoglobin level, and neuroimaging findings were reviewed in detail to analyze the stroke nature and verify the possible pathogenesis. Twelve patients (males 8; mean age 74.9 years) were included. Eleven patients had cerebral infarction after acute massive gastrointestinal bleeding, and one had cerebral infarction following postoperative extensive hematoma during hospitalization. In all patients, borderzone infarction was the most characteristic finding: six had unilateral and six had bilateral borderzone infarction. Mean hemoglobin at infarction after acute blood loss was 5.8 g/dl, with 46% reduction from baseline. Of nine patients receiving detailed extracranial and intracranial vascular studies, none had severe carotid stenosis and six had intracranial stenosis. The arterial borderzones are the most vulnerable regions to a fall in cerebral perfusion. Acute anemia may produce cerebral blood flow insufficiency, reduce oxygen-carrying capacity, and result in distal-field tissue ischemic injury when hemoglobin level decreases below a critical level, especially in patients with intracranial stenosis.

THE "GOLDEN HOUR" AND ACUTE BRAIN ISCHEMIA

PRESENTING FEATURES AND LYTIC THERAPY IN >30 000 PATIENTS ARRIVING WITHIN 60 MINUTES OF STROKE ONSET

Jeffrey L. Saver, Eric E. Smith Gregg C. Fonarow, Mathew J. Reeves, Xin Zhao, DaiWai M. Olson, Lee H. Schwamm, on behalf of the GWTG-Stroke Steering Committee and Investigators

Stroke. 41;1431-1439: 2010

Background and Purpose

The benefit of intravenous thrombolytic therapy in acute brain ischemia is strongly time dependent.

Methods— The Get With the Guidelines–Stroke database was analyzed to characterize ischemic stroke patients arriving at hospital Emergency Departments within 60 minutes of the last known well time from April 1, 2003, to December 30, 2007.

Results

During the 4.75-year study period, among 253 148 ischemic stroke patients arriving directly by ambulance or private vehicle at 905 hospital Emergency Departments, 106 924 (42.2%) had documented, exact last known well times. Onset to door time was 60 minutes in 30 220 (28.3%), 61 to 180 minutes in 33 858 (31.7%), and >180 minutes in 42 846 (40.1%). Features most strongly distinguishing the patients arriving at 60, 61 to 180, and >180 minutes were greater stroke severity (median National Institutes of Health Stroke Scale score, 8.0 vs 6.0 vs 4.0, P<0.0001) and more frequent arrival by ambulance (79.0%. vs 72.2% vs 55.0%, P<0.0001). Compared with patients arriving at 61 to 180 minute, "golden hour" patients received intravenous thrombolytic therapy more frequently (27.1% vs 12.9%; odds ratio=2.51; 95% CI, 2.41–2.61; P<0.0001), but door-to-needle time was longer (mean, 90.6 vs 76.7 minutes, P<0.0001). A door-to-needle time of 60 minutes was achieved in 18.3% of golden hour patients.

Conclusions

At Get With the Guidelines-Stroke hospital Emergency Departments, more than one quarter of patients with documented onset time and at least one eighth of all ischemic stroke patients arrived within 1 hour of onset, where they received thrombolytic therapy more frequently but more slowly than late arrivers. These findings support public health initiates to increase early presentation and shorten door-to-needle times in patients arriving within the golden hour.

CONSCIOUS SEDATION VERSUS GENERAL ANESTHESIA DURING ENDOVASCULAR THERAPY FOR ACUTE ANTERIOR CIRCULATION STROKE

PRELIMINARY RESULTS FROM A RETROSPECTIVE, MULTICENTER STUDY

Alex Abou-Chebl, Ridwan Lin, Muhammad Shazam Hussain, Tudor G. Jovin, Elad I. Levy, David S. Liebeskind, Albert J. Yoo, Daniel P. Hsu, Marilyn M. Rymer, Ashis H. Tayal, Osama O. Zaidat, , Sabareesh K. Natarajan, Raul G. Nogueira, Ashish Nanda, Melissa Tian, Qing Hao, Junaid S. Kalia, Thanh N. Nguyen, Michael Chen, Rishi Gupta

Stroke 41;1175-1179: 2010

Background and Purpose

Patients undergoing intra-arterial therapy (IAT) for acute ischemic stroke receive either general anesthesia (GA) or conscious sedation. GA may delay time to treatment, whereas conscious sedation may result in patient movement and compromise the safety of the procedure. We sought to determine whether there were differences in safety and outcomes in GA patients before initiation of IAT.

Methods

A cohort of 980 patients at 12 stroke centers underwent IAT for acute stroke between 2005 and 2009. Only patients with anterior circulation strokes due to large-vessel occlusion were included in the study. A binary logistic-regression model was used to determine independent predictors of good outcome and death.

Results

The mean age was 66±15 years and median National Institutes of Health Stroke Scale score was 17 (interquartile range, 13–20). The overall recanalization rate was 68% and the symptomatic hemorrhage rate was 9.2%. GA was used in 44% of patients with no differences in intracranial hemorrhage rates when compared with the conscious sedation group. The use of GA was associated with poorer neurologic outcome at 90 days (odds ratio=2.33; 95% CI, 1.63–3.44; P<0.0001) and higher mortality (odds ratio=1.68; 95% CI, 1.23–2.30; P<0.0001) compared with conscious sedation.

Conclusions

Patients placed under GA during IAT for anterior circulation stroke appear to have a higher chance of poor neurologic outcome and mortality. There do not appear to be differences in hemorrhagic complications between the 2 groups. Future clinical trials with IAT can help elucidate the etiology of the differences in outcomes.

RISK FACTORS FOR ISCHAEMIC AND INTRACEREBRAL HAEMORRHAGIC STROKE IN 22 COUNTRIES (THE INTERSTROKE STUDY): A CASE-CONTROL STUDY

Dr Martin J O'Donnell, Prof Denis Xavier, Prof Lisheng Liu, Prof Hongye Zhang, Siu Lim Chin, Purnima Rao-Melacini, Sumathy Rangarajan, Shofiqul Islam, Prof Prem Pais, Prof Matthew J , Charles Mondo, Prof Albertino Damasceno, Prof Patricio Lopez-Jaramillo, Prof Graeme J Hankey, Prof Antonio L Dans, Prof Khalid Yusoff, Thomas Truelsen, Prof Hans-Christoph Diener, Prof Ralph L Sacco, Prof Danuta Ryglewicz, Prof Anna Czlonkowska, Prof Christian Weimar, Prof Xingyu Wang, Prof Salim Yusuf

The Lancet 376; 112 – 123: 2010

Background

The contribution of various risk factors to the burden of stroke worldwide is unknown, particularly in countries of low and middle income. We aimed to establish the association of known and emerging risk factors with stroke and its primary subtypes, assess the contribution of these risk factors to the burden of stroke, and explore the differences between risk factors for stroke and myocardial infarction.

Methods

We undertook a standardised case-control study in 22 countries worldwide between March 1, 2007, and April 23, 2010. Cases were patients with acute first stroke (within 5 days of symptoms onset and 72 h of hospital admission). Controls had no history of stroke, and were matched with cases for age and sex. All participants completed a structured questionnaire and a physical examination, and most provided blood and urine samples. We calculated odds ratios (ORs) and population-attributable risks (PARs) for the association of all stroke, ischaemic stroke, and intracerebral haemorrhagic stroke with selected risk factors.

Findings

In the first 3000 cases (n=2337, 78%, with ischaemic stroke; n=663, 22%, with intracerebral haemorrhagic stroke) and 3000 controls, significant risk factors for all stroke were: history of hypertension (OR 2•64, 99% CI 2•26—3•08; PAR 34•6%, 99% CI 30•4—39•1); current smoking (2•09, 1•75—2•51; 18•9%, 15•3—23•1); waist-to-hip ratio (1•65, 1•36—1•99 for highest vs lowest tertile; 26•5%, 18•8—36•0); diet risk score (1•35, 1•11—1•64 for highest vs lowest tertile; 18•8%, 11•2—29•7); regular physical activity (0•69, 0•53—0•90; 28•5%, 14•5—48•5); diabetes mellitus (1•36, 1•10—1•68; 5•0%, 2•6—9•5); alcohol intake (1•51, 1•18—1•92 for more than 30 drinks per month or binge drinking; 3•8%, 0•9—14•4); psychosocial stress (1•30, 1•06—1•60; 4•6%, 2•1—9•6) and depression (1•35, 1•10—1•66; 5•2%, 2•7—9•8); cardiac causes (2•38, 1•77—3•20; 6•7%, 4•8—9•1); and ratio of apolipoproteins B to A1 (1•89, 1•49—2•40 for highest vs lowest tertile; 24•9%, 15•7—37•1). Collectively, these risk factors accounted for 88•1% (99% CI 82•3—92•2) of the PAR for all stroke.

When an alternate definition of hypertension was used (history of hypertension or blood pressure >160/90 mm Hg), the combined PAR was 90•3% (85•3—93•7) for all stroke. These risk factors were all significant for ischaemic stroke, whereas hypertension, smoking, waist-to-hip ratio, diet, and alcohol intake were significant risk factors for intracerebral haemorrhagic stroke.

Interpretation

Our findings suggest that ten risk factors are associated with 90% of the risk of stroke. Targeted interventions that reduce blood pressure and smoking, and promote physical activity and a healthy diet, could substantially reduce the burden of stroke.

SPONTANEOUS HYPERVENTILATION AND BRAIN TISSUE HYPOXIA IN PATIENTS WITH SEVERE BRAIN INJURY

Emmanuel Carrera, J Michael Schmidt, Luis Fernandez, Pedro Kurtz, Maxwell Merkow, Morgan Stuart, Kiwon Lee1, Jan Claassen, E Sander Connolly, Stephan A Mayer, Neeraj Badjatia

J Neurol Neurosurg Psychiatry 81;793-797:2010

Background

Hyperventilation has been shown to be associated with cerebral vasoconstriction and increased risk of infarction. Our aim was to determine whether spontaneous reduction in end-tidal CO2 (EtCO2) was associated with an increased in brain tissue hypoxia (BTH).

Method

We studied 21 consecutive patients (mean age 50±16 years; 15 women) undergoing continuous monitoring for brain tissue oxygenation (PbtO2), intracranial pressure (ICP), cerebral perfusion pressure (CPP) and EtCO2; mean values were recorded hourly BTH was defined as brain tissue oxygen tension (PbtO2) <15 Hg. mm

Results

Diagnoses included subarachnoid haemorrhage (67%), intracranial haemorrhage (24%) and traumatic brain injury (10%). Overall, BTH occurred during 22.5% of the study period (490/2179 hourly data). The frequency of BTH increased progressively from 15.7% in patients with normal EtCO2 (35–44 Hg) to 33.9% in patients with EtCO mm2<25 Hg mm (p<0.001). The mean tidal volume and minute ventilation were 7±2 ml/kg and 9±2 1/min, respectively. Hypocapnia was associated with higher measured-than-set respiratory rates and maximal minute ventilation values, suggestive of spontaneous hyperventilation. Using a generalised estimated equation (GEE) and after adjustment for GCS, ICP and core temperature, the variables independently associated with BTH events were EtCO2 (OR: 0.94; 95% CI 0.90 to 0.97; p<0.001) and CPP (OR: 0.98; 95% CI 0.97 to 0.99; p=0.004).

Conclusion

The risk of brain tissue hypoxia in critically brain-injured patients increases when EtCO2 values are reduced. Unintentional spontaneous hyperventilation may be a common and under-recognised cause of brain tissue hypoxia after severe brain injury.

"Book Review"

Jim Cottrell's, 5th Edition entitled " Cottrell and Young's Neuroanesthesia" has been decorating the bookshelf of all the medical book stores. This time, in comparison to the previous edition Jim has roped in William L. Young as the Co-editor, a dynamic, highly respected neurovascular researcher and a reputed neuroscientist. His review article on "Anesthetic considerations for interventional neuroradiology" (Anesthesiology 1994) still is a masterpiece. He, like Jim, is also a great luminary in the field of Neuroanesthesia. So one can imagine, when two icons join their hands for any project the result will only yield nothing, but, excellent outcome. The testimony is the, 5th Edition "Neuroanesthesia" book, with a beautiful and exquisite cover, in contrast to the previous edition.

The present edition unlike previous one has few distinct characteristics. The first and foremost being the sleek volume (464 pages) in comparison to the previous edition (784 pages). It has 25 chapters which is of interest to "anesthesiologists". Take home messages are highlighted in light grey blue colour which I am sure will attract the eyes of readers. All the chapters are well reviewed and written in lucid style which will create interest in the minds of readers to go through the chapters time and again. Another major deviation in this book is the deletion of chapters related to surgical procedures. This has made the book trim and slim. Fifty three authors have contributed though, 23 authors have contributed for the first time. Seven new chapters have been included in this book. After a cursory view of all the chapters I seriously think a chapter on anatomical aspect of the brain and spinal cord and a chapter on post operative pain management following neurosurgical operations should have been included. Post operative pain management remains still a neglected area not only by the neurosurgeons but also by the anesthesiologists. Nevertheless, this is a book for the professionals, which is up-to-date, concise and comprehensive as it can be, with regards to both its science and its practice. This book is truly a book for the superspeciality.

A good number of text books pertaining to Neuroanesthesia have flooded the medical book stores and libraries (personal/institutional). All those have disappeared after single or two edition. But, Cottrell's book is being published at regular intervals with evolving and improving with each edition. Not only, I have got the previous two but, even all my neuroanaesthesia faculties have also both previous editions.

This is a book, of course for the qualified professionals but, a good reference book on neuroanesthesia for the postgraduates. All my colleagues and few of my postgraduates already have purchased the latest one. The 5th Edition "Cottrell and Young's Neuroanesthesia" book a must buy so as to keep up-to-date with the clinical practice in neuroanesthesia. So what for are you waiting?

H.H. Dash
Chief, Neurosciences Centre &
HOD, Neuroanaesthesiology, AIIMS, New Delhi

TRAVEL GRANT

ISNACC will award Travel Grant to suitable candidates to either visit one of the premier Neuroanaesthesiology centres in India or to present one or more free papers in the ISNACC annual conference. A fixed sum of Rs. 10,000/- each will be awarded to 2 candidates who must fulfill the following criteria:

- Should be a life member of ISNACC.
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- Should provide a certificate attesting that he or she is a Junior Resident or Senior Resident.

Application along with documents supporting your candidature should reach the ISNACC Secretariat by 31 December 2010.

RESEARCH GRANT

ISNACC will award one research grant to a suitable candidate to carry out clinical research in the field of Neuroanaesthesia and critical care in India. A fixed sum of Rs. 10,000/- will be awarded to one candidate who must fulfill the following criteria:

- Candidate must be a life member of ISNACC
- Working certificate in Dept. of Neuroanaesthesia has to be submitted from the HOD.
- Ethics committee's approval is mandatory.
- Information pertaining to any other financial assistance for the project from other sources must be provided.
- Four copies of the research project, in the proper format should be submitted to the Secretariat on or before 31st December 2010.

NEWS ITEM

1. Dr. Gayanendra Pal Singh passed D.M. Neuroanaesthesia in May, 2010 from AIIMS.

   He joined as a Senior Research Associate (Pool Officer, CSIR ,Government of India) and presently working at AIIMS.

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