



### Neurosurgical Procedures in Jehovah's Witnesses: The Tema Experience

*Les Procédures de Neurochirurgie dans les Témoins de Jéhovah: Experience Tema*

N. B. Andrews

#### ABSTRACT

**BACKGROUND:** On account of religious reasons, Jehovah Witnesses do not accept blood or blood products; occasionally, they accept reinfusion of autologous blood via a cell saver during surgery.

**OBJECTIVE:** The aim of this study was to document the demographics of Jehovah Witnesses undergoing neurosurgical procedures, the neurosurgical procedures undertaken in Jehovah Witnesses and to evaluate the complications of the procedures.

**METHODS:** A retrospective audit of the medical records of all Jehovah's Witnesses who underwent neurosurgical procedures at our institution, from January 1<sup>st</sup> 2000 to December 31<sup>st</sup> 2006, was carried out. The parameters investigated included demographics, pre and post operative diagnosis, type of neurosurgical procedure and complications.

**RESULTS:** Nineteen patients (fifteen male, four female; male/female 3.8:1) constituted the series. The mean age was 45.8 (range: 20–65) years. A total of 21 procedures were performed; intracranial surgery (33%), spinal surgery (67%). No autotransfusion of blood was given. Lumbar laminectomy for stenosis was the commonest spine procedure, ten (71.4%); craniotomy for tumor excision was the commonest intracranial procedure, six (85.7%). With respect to the whole series, the morbidity rate was 4.7% and the mortality rate was 4.7%; both were from intracranial surgery.

**CONCLUSION:** It is possible to perform certain types of neurosurgical procedures in Jehovah's Witnesses without increasing the mortality and morbidity rate. *WAJM* 2009; 28(3): 148–150.

**Key words:** Blood transfusion; Neurosurgery; Tema, Jehovah's Witnesses; Ghana.

#### RÉSUMÉ

**CONTEXTE:** À cause des raisons religieuses, Jéhovah Witnesses n'accepte pas de produits de sang ou de sang; de temps en temps, ils acceptent la réinjection de sang autologous via un épargnant de cellule pendant la chirurgie(l'opération).

**OBJECTIF:** le but de cette étude était de documenter les caractéristiques sociodémographiques de Jéhovah Witnesses subissant des procédures de neurochirurgie, les procédures de neurochirurgie entreprises dans Jéhovah Witnesses et évaluer les complications des procédures.

**MÉTHODES :** un audit rétrospectif des dossiers(archives) médicaux des Témoins de tout le Jéhovah qui ont subi des procédures de neurochirurgie à notre institution, du 1 janvier 31e 2006 de 2000 décembre, a été réalisé. Les paramètres ont enquêté sur les caractéristiques sociodémographiques incluses, pre et poster le diagnostic en vigueur, le type de procédure de neurochirurgie et de complications.

**RÉSULTATS:** Dix-neuf patients (quinze mâle, quatre femelle; mâle/femelle 3.8:1) a constitué la série. L'âge moyen était 45.8 (gamme : 20–65) années. Un total de 21 procédures a été exécuté; la chirurgie(l'opération) intracrânienne (33 %), la chirurgie(l'opération) spinale (67%). Aucune autotransfusion sanguine de sang n'a été donnée. Laminectomy lombaire pour stenosis était la procédure de colonne vertébrale la plus commune, dix (71.4 %); craniotomy pour l'excision de tumeur était la procédure intracrânienne la plus commune, six (85.7 %). En ce qui concerne la série entière, le taux de morbidité était 4.7 % et le taux de mortalité était 4.7 %; tous les deux étaient de la chirurgie(l'opération) intracrânienne.

**CONCLUSION:** Il est possible d'exécuter de certains types de procédures de neurochirurgie dans les Témoins de Jéhovah sans augmenter le taux de morbidité et la mortalité. *WAJM* 2009; 28(3): 148–150.

**Mots clé:** la Neurochirurgie, Tema, les Témoins de Jéhovah, le Ghana.

**INTRODUCTION**

The right of a patient to self-determination and the freedom of religious practice is fundamental and inviolable. These rights are therefore protected by law in most countries. Consequently, a patient's refusal of blood transfusion for religious reasons even in life-threatening circumstances poses a treat to physician or surgeon with formidable challenges – especially, in the health resource deprived environment of sub-Saharan Africa.

Adherents of the Jehovah Witness sect believe that Biblical passages forbid the transfusion of whole blood, erythrocyte concentrations, plasma, the administration of leukocyte and thrombocyte concentrations. However, most members of the group accept auto-transfusion of blood provided aiding device for autotransfusion (e.g. a cell saver) is attached in a closed system connected to the their circulation and that the blood is NOT stored.<sup>1,2</sup> Unfortunately these facilities are not routinely available in our sub-region.

The aim of this study is to document the demographics, types of neurosurgical procedures and complications arising from the procedures.

**PATIENTS AND METHODS**

Nineteen consecutive Jehovah Witnesses who underwent neurosurgical procedures at our institution, Tema International NeuroCenter, over an eighty four month period (from 1<sup>st</sup> January 2000 – 31<sup>st</sup> December 2006) had their medical records retrospectively analysed.

The parameters evaluated included demographics, type of surgery and complications. The preoperative blood count was recorded; blood loss of more than 20% of the estimated blood volume or a decrease in hemoglobin to under 8g/dl was registered as hemodynamically relevant. Other factors noted were the use of electrocautery, intraoperative vessel clips, non-autologous tissue adhesives or other hemostatic agents. The length of surgery and length of hospital stay were also documented.

**RESULTS**

Nineteen patients (fifteen male, four female; male/female ratio 3.8:1) constituted the series. The patients' ages

ranged from twenty to sixty five years (mean age, 45.8 years); Nine patients (47%) were permanently resident outside Ghana. A total of twenty one procedures were performed; these constituted 4.1% of the neurosurgical procedures performed during the period. Two patients underwent two procedures each on different occasions- one underwent both a cervical and lumbar laminectomy (six months apart) and the other underwent two cervical laminectomies (four years apart) for excision of a benign schwanomma.

The preoperative hematological parameters consisting of hemoglobin, hematocrit, erythrocyte, thrombocyte, leukocyte counts, and coagulation profiles were all within normal range. none of the patients had anemia or coagulation disorders. Preoperative hemoglobin level in all patients was at least 12g/dl.

Bipolar electrocautery was used in twenty (95.2%) of the procedures. Only crystalloid solutions were used for intraoperative and postoperative volume substitution.

The breakdown of spinal and intracranial cases with respect types of procedures and the following parameters as blood loss, length of operation, length of hospital stay, morbidity and mortality are provided in Tables 1 and 2 respectively.

One patient (4.7%) had an infected

scalp wound which cultured Klebsiella and required debridement and antibiotics. There was one mortality (4.7%) – the patient on the third postoperative day suffered a cerebrovascular ischemic event (not related to blood loss) following a supraciliary craniotomy and endoscope assisted resection of a large pituitary adenoma. Sub-total excisions (Simpson Grade 3) were achieved for two patients with huge parasagittal meningiomas that involved the posterior third of the sagittal sinus.

**DISCUSSION**

Traditionally, many surgical specialties have adopted restrictive surgical indications with respect to Jehovah Witnesses on account of their refusal of blood transfusion for religious reasons. However, technical innovations in surgical and anesthesia practice have enabled an increasing number of surgical procedures to be performed without blood transfusion.<sup>3,4,5,6</sup> These capabilities, when readily available satisfy the requirements of Jehovah's Witnesses and probably more importantly reduce the risk of transfusion, related transmission of infectious diseases, transfusion accidents, increasing shortages of blood and reduces the costs associated with transfusions. This is not the situation in West Africa; all our patients indicated that

**Table 1: Summary of Diagnoses and Procedures**

Diagnosis and Procedure	No. of cases (%)	M	F
<b>Spinal diseases</b>	<b>14 (66.3)</b>		
Cervical Laminectomy for Stenosis	1 (4.7)	1	0
Cervical Laminectomy and excision of tumor	2 (9.4)	0	2
Anterior cervical discectomy and fusion for spondylosis	1 (4.7)	1	0
Lumbar Laminectomy for stenosis	10 (47.6)	10	0
<b>Intracranial diseases (n=7)</b>			
Stereotactic Brain Biopsy	1 (4.7)	0	1
Craniotomy for tumor excision	6 (28.6)	5	1

**Table 2: Outcome of Surgical Procedures**

Mean (Range)	Spine	Intracranial
Blood loss (mls)	110 (80–200)	229 (10–450)
Length of operation (min)	87 (70–132)	127 (35–177)
Length of hospital stay (days)	5.3 (1–10)	10 (1–28)
Morbidity (%)	0	4.7
Mortality (%)	0	4.7

they had previously been refused surgery elsewhere on account of what was deemed an unacceptably high surgical risk because of refusal to consent to blood transfusion; 47% of the patients in the series had traveled to us from outside Ghana. This brings our focus on the conflict between the obligation to respect the patient's right to self-determination, religious freedom and the physician's duty to save the patient's life. "Forced" transfusions can lead to serious legal and psychosocial consequences; it is clearly not an option but alternative strategies must be found.<sup>3</sup>

The management of acute intra-operative blood loss involves the maintenance of intravascular volume. Up to 20% of total blood volume loss can be managed with the substitution of crystalloid electrolyte solutions or colloidal volume substitutes.<sup>3</sup> Other modalities that are important to institute in concert are, minimizing iatrogenic and hemorrhagic blood loss, maximizing perioperative blood production, maximizing cardiac output, increasing oxygen content, and decreasing metabolic rate. With these multiple strategies it was possible to utilize only crystalloid electrolyte solutions and no cell saver to prevent hemodynamically relevant blood loss – i.e. blood loss of more than 20% of blood volume or decrease in hemoglobin of less than 8g/dl. On account of these parameters it was important to limit the extent of tumor resection in two large parasagittal meningiomas involving the posterior third stage of the sagittal sinus. This possibility was distinctly discussed with the patients prior to surgery, and informed consent was obtained for the operation.

There were two complications comprising one postoperative wound infection and one postoperative death. The causes of death were not in any way related to post operative anemia. This is not a variance with the complication rates published for neurosurgical interventions in our sub-region and beyond (3, 7, 8, 9, 10). Well designed and controlled studies have demonstrated that there is no statistically significant increase in morbidity or mortality for Jehovah's Witnesses.<sup>3, 9, 10</sup>

Further studies are needed in our sub-region in order to examine a large group of Jehovah's Witnesses undergoing neurosurgical interventions and comparing them to a well matched, valid control group. Such studies will then demonstrate a number of statistically significant differences as well as important similarities between the two patient groups.

In conclusion, certain types of neurosurgical procedures can be carried out in Jehovah's Witnesses while utilizing only crystalloid electrolyte replacement solutions for maintenance of intravascular volume without increasing morbidity or mortality.

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