

Trauma in Papua New Guinea: what do we know and where do we go?

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SUMMARY

Trauma is a major health problem in Papua New Guinea. Injuries are the commonest cause of death in the productive age group of 15-44 years. Trauma is the leading cause of surgical death in Port Moresby General Hospital. The common causes of injury are road traffic accidents, domestic violence, criminal assault, tribal fights, accidents at home and at work, burns and falls. This review summarizes what has been published on the different causes of trauma in Papua New Guinea. Though much has been written little has been done to implement the recommendations made. Papua New Guinea needs a spinal unit and it needs burns units in its major hospitals. There should be better facilities for rehabilitation. Little has been done to curb tribal fighting and domestic violence. Road traffic fatalities have at least remained static in the last decade and wearing seat belts is now compulsory, but the law must be enforced. Driving after drinking alcohol must be stopped and protective roll bars or cages must be fitted to all open-back utility vehicles which carry passengers. Progress requires vision and commitment by surgeons, leaders in public health, hospital administrators and politicians.

Introduction

Trauma is a major health problem in Papua New Guinea (PNG) as in other developing countries (1,2). This is apparent from both health department statistics and hospital-based studies. Injuries are the fourth commonest cause of death for all ages in the Tari Basin but the commonest cause in the age group 15-44 years (4029 deaths/100000/year for this age group). In the Asaro Valley injury is the leading cause of death (3296/100000/year) after the first five years of life, overtaking acute lower respiratory tract infection. In Mendi trauma is responsible for 11.5% of hospital admissions, the third commonest cause after childbirth and pneumonia (3). Trauma is also the leading cause of surgical death in Port Moresby General Hospital (4), where over 70% of the deaths occur before the patient reaches hospital.

The common causes of injury are road accidents, domestic violence, criminal assault,

tribal fights, accidents (at home and at work), burns and falls. This review aims to summarize what has been published on the different causes of trauma or the types of injury encountered such as penetrating wounds, abdominal trauma and head injuries. Little has been published on fractures, the commonest cause of admission to hospital. Osteoporotic fractures such as fractured neck of femur and Colles fracture are very rare (3,5).

Road traffic accidents

The number of road traffic accidents (RTAs) increased by over 400% between 1968 and 1978 (6) but the number of accidents then declined from 6867 in 1981 to 4906 in 1990 (Police Statistics, Annual Report 1990). Data from other developing countries suggest that the number of road accidents increases exponentially during development. Has PNG levelled off or is a further surge in the incidence likely with further industrialization? The fatal accident rate in New Zealand is

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around 600-700 per annum, a rate of 3 per 10000 registered vehicles. In 1988 in PNG there were 347 fatalities and 49 170 registered vehicles giving a rate of 71 per 10000 registered vehicles. Thus although more people in New Zealand (population 3.4 million) die on the roads the effect of each vehicle on road fatalities is over 20 times higher in PNG (population 3.5 million). Alcohol is also a significant factor. Studies in the 1970s and 1990s showed that over a third of weekend drivers involved in accidents had blood alcohol levels above 80 mg/100 ml (6,7).

A survey of casualties from RTAs attending Port Moresby General Hospital over a seven-month period in 1982-1983 showed that of 209 RTA patients seen, one-third were in cars and one-quarter were in utilities (8). Only 11.4% of front seat occupants wore seat belts (9). Lourie (9) estimated that the human and economic cost of RTA casualties between 1982 and 2000 would be 5000 dead, 50 000 injured and 250 million kina. Ten years later seat belts are compulsory and the accident rate appears stable with 5000 accidents and 250-300 deaths per year. Lourie's estimates appear accurate though the current cost may be greater as a result of inflation and devaluation.

Accidents involving open-backed utility vehicles are responsible for many fatalities due to occupants being thrown out of the vehicle (10). Currently there is no legislation insisting on roll bars or cages to provide some protection to such passengers and so reduce the number injured and the severity of injury.

Domestic violence

Trauma affecting women is often the result of domestic violence. In Port Moresby this accounted for 90% of Casualty attendances (TD, unpublished) and in Mendi it accounted for 65 of 148 (44%) female injuries and 6% of all surgical admissions (3). Studies by the Law Reform Commission found that two-thirds of women have been beaten and two-thirds of men admit to beating their wives (11,12).

Wife-beating is regarded as an acceptable practice by 65% of rural men and 46% of urban men in PNG (13). 57% of rural women and 25% of urban women also said that wife-beating is acceptable (13). The use of weapons for marital violence is regarded as less

acceptable. The perceived causes of domestic violence in rural communities are sexual jealousy, failure of a wife to fulfil her duties or dislike of the spouse. In urban communities alcohol, money problems and sexual jealousy are the perceived causes. When men are injured by a spouse it is normally due to retaliation or self-defence (13).

Domestic violence represents a significant cost to the community and the family. Women in PNG need to be made more aware of their rights through education and the media, and be supported in their complaints by the police and the medical profession. The attitude that it is an acceptable practice needs to be changed but such entrenched beliefs may take generations to eradicate and will need the support of the courts, police, medical profession and education system. A recent statement by a judge supporting a husband's right to rape his wife thankfully caused a great deal of criticism and an apology by the Chief Justice (Post-Courier 3 Jul 95). However, it depicts how many people believe that a woman has less rights than a man. Support for women's rights has often been lacking despite the efforts made by the Law Reform Commission (11-14). Real change in attitudes may only be achieved if we target school children and promote the right of women not to be beaten by their partners.

The actual injuries sustained in domestic violence have been less extensively studied. Enlarged spleens are at risk, which is probably the commonest cause of fatality. The use of the oblique forehead flap for loss of the nose tip in human bite injuries sustained in lovers' tiffs has been reported by Ollapallil et al. (15). In Mendi, Mathew et al. (3) found that the commonest injuries due to domestic violence were fractures (49%) and soft tissue injuries (29%). Olecranon and forearm fractures were the commonest single injuries due to the arm being held above the head to protect the victim from a blow. These fractures normally require internal fixation to achieve a good outcome, a treatment which is not available in most centres in PNG. The development of sound orthopaedic practice through the University of Papua New Guinea and Australian Orthopaedic Association Training Programme should improve the management of these and other fractures. At present probably 25% of cases suffer permanent disability, much of which could be avoided.

Industrial injuries

Compensation for injury is a well-established principle in PNG. The only papers which relate specifically to worker's compensation have contained limited data (16,17). Department of Labour figures in 1976 showed that there were 110 fatal and 537 nonfatal accidents, of which about 40% involved motor vehicles. Further data are to be presented in the Trauma Services Review (TD, unpublished) but there is no incentive for companies to present their health and safety records. Chevron reported the value of teaching defensive driving to the Second Road Traffic Safety Seminar in Lae in 1994 (7).

Tribal fights and penetrating trauma

Lennox and Kia (18) audited 4 years of surgery and anaesthesia at Enga Provincial Hospital. Arrow and spear wounds in 193 adults constituted 14% of all procedures. 13 cases of arrow wounds to the heart and mediastinum were reported by Fingleton (19). Arrow wound management in 90 cases was reported by Van Gurp et al. (20) in Mendi, covering intracranial, thoracic and abdominal injuries. Injuries due to tribal fights accounted for 24% of all trauma admissions to Mendi Hospital in 1993 (3). A fifth of these injuries are now due to firearms. Jacob (21) has reported a series of 63 arrow wounds to the chest and abdomen in Mt Hagen with only 2 deaths. The essential message is that the arrow or spear should be left in place until the patient is anaesthetized and the surgeon has explored the wound. The injuries sustained show that the surgeon must be competent in the chest, neck and abdomen and capable of dealing with vascular and neurotrauma as well as trauma to the heart, lungs and abdominal viscera.

Bush thoracotomy, a practice favoured by some traditional healers, has a significant complication rate. 60 cases were reported by Fingleton (22). The complications included empyema (40 cases), osteomyelitis of the rib (2 cases) and pneumothorax (1 case).

Abdominal trauma

Spleens of people in the tropics may be enlarged and are therefore more prone to injury. One study from Nigeria reported that 10 of 27 splenic injuries were in enlarged spleens (23). Splenic trauma seems particularly

common in PNG. Hamilton and Pikacha (24) reported 62 cases of ruptured spleen. 19 patients died before treatment could be commenced. The others survived, 26 spleens being conserved and 17 removed. 4 cases of delayed rupture were seen but no conservatively treated patient had a delayed haemorrhage. With a series of 205 ruptured spleens the Papua New Guinea Splenic Injury Study Group (25) reported that 130 were managed nonoperatively, successfully so in 80%. Splenectomy was performed in 70 patients with 8 deaths; 3 were in the 27 nonoperatively managed cases said to have failed. No death was due to operative delay. In malaria-endemic areas it is important to conserve the spleen to optimize resistance to malaria. One splenectomized patient reported by Hamilton and Pikacha (24) is known to have died of cerebral malaria. Four cases of malaria following splenectomy were reported from Thailand, none of which were fatal (26). The only definitive study on the incidence of malaria and other illness after splenectomy in the tropics is that by Boone and Watters (27), who found that 88% of splenectomized patients had malarial parasites in their blood film on follow-up 1-10 years after splenectomy compared with 18% of those whose spleens were conserved. Therefore every effort should be made to conserve the traumatized spleen in the tropics as long as the patient's life is not put at risk. Conservation may require laparotomy, exclusion of other intraabdominal injuries and repair of the damaged spleen. Operative inspection and active conservation of the spleen is safer than observation and transfusion in patients whose vital signs are unstable or whose abdominal signs are deteriorating.

Other types of injury

Mandibular fractures were studied by Malden (28), who noted a longer period of pre-fixation conservative treatment, elective use of local anaesthesia for all but the occasional operative procedure, a more aggressive attitude towards traumatized or infected teeth lying in fracture sites, and confining all those patients undergoing intermaxillary fixation to hospital for the duration of treatment. Eye injuries have been reviewed by Parsons (29) and have been the subject of conference presentations by George Jacob and Nitin Verma (both unpublished).

The first formal study on head injuries in PNG is published in this issue by Liko et al. (30). The Glasgow Coma Scale was introduced in the 1980s and its use is well established. Spinal injuries do poorly because there is no spinal unit and the patients must be treated in general surgical wards with inadequate numbers of nurses. Gee and Sinha (31) published a series of 36 patients from Port Moresby, Lae and Madang; 34% resulted from a motor vehicle accident, 40% from falls, 6% from sports injuries and 6% from assault. Although only 5% of patients died, 69% developed pressure sores and 61% urinary tract infections. Gee and Sinha proposed a National Spinal Cord Register. None has yet been established.

Other studies from PNG have concentrated on exotic injuries such as tree and coconut injuries (32,33), penetrating wounds by fish (34), pig bites (35) and grass-skirt burns (36). Although these are rare, falling coconuts are an important cause of head injury in the tropics and sword-fish sometimes cause unrecognized penetrating injuries which may present with vascular injury, arteriovenous fistula or false aneurysm. Some case reports have been published highlighting the importance of vascular injuries and false aneurysms following penetrating injuries (37,38). Surprisingly, little has been published on fractures from PNG, the commonest injury resulting in admission to hospital. There are some fracture data in the papers by Barss (5) from Milne Bay and Mathew et al. (3) from Mendi.

Conclusion

A great deal of trauma research has been performed in the last 20 years. We owe it to our patients and to society to be aware of it and to heed the recommendations made. For example, in a review of surgical mortality at Port Moresby General Hospital (1975-1981) it was recommended that a burns unit be established to prevent unnecessary deaths from burns sepsis (39). Thirteen years later in the mid-1990s it seems that little attention has been paid to it. In our research we are in danger of reinventing the wheel by repeating studies, writing reports but not doing anything to either reduce the incidence or improve the outcome of trauma. Progress will involve vision and commitment not only by surgeons but also by

hospital management and politicians. Papua New Guinea needs a spinal unit, burns units in its major hospitals and better facilities for rehabilitation. Amputees are rarely fitted with a prosthesis although the 1996-2000 health plan aims to provide adequate staff and facilities in the limb-fitting unit in Lae, which has also recently received substantial support from Friends of the Disabled (FODA).

It is disappointing that so little has been achieved in preventing trauma particularly with regard to tribal fights and domestic violence. The only good news is that road traffic fatalities have at least remained static in the last decade although no progress has been made with regard to dissuading drivers from drinking alcohol and there is no testing by breathalyser. Lessons learned with regard to the clinical management of trauma are now being taught within the University of Papua New Guinea surgical training programs. The development of orthopaedic training in PNG should lead to a reduction in hospital stay and permanent disability due to limb injuries.

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