PRACTICE REVIEW

The history of paediatric trauma care in Cape Town

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Trauma is a leading cause of morbidity, mortality and disability in childhood. In most developed countries where 18% of the population are in the age group 0 - 15 years, injury exceeds all other causes of childhood mortality. In the developing countries of Africa, however, children aged 0 - 15 years constitute 43% of the population and trauma has an even bigger impact on child health.[1]

There is an erroneous perception that trauma is not a major health problem in Africa, derived from undue emphasis on mortality statistics alone. Yet, the impact of trauma ought to be measured not only in terms of death, but also the tremendous morbidity and disability caused by injuries, and their socio-economic consequences.[2]

History of emergency care

Until the late 60s and early 70s of the last century, medical trauma care received very little attention in most communities or from health care providers. Emergency medical care became a focus of widespread and continuing attention following publication in 1966 of the landmark report of the National Academy of Sciences (NAS) and the National Research Council (NRC): *Accidental Death and Disability: The Neglected Disease of Modern Society*. Morticians provided up to 50% of prehospital transport before that time, perhaps largely because hearses were the only available vehicles to accommodate stretchers.[3] The need for and success of emergency trauma care was firmly established by military surgeons on the battlefields of Korea and Vietnam.

Emergency care of children in Africa

The burden of trauma weighs heavily among all other diseases in modern times and although the industrialisation of Africa lags behind other continents, the most deadly transport vehicle, the motor car, continues to wreak havoc among our young population. There are reports that motor cars in Africa are responsible for more than 200 times more accidents, injuries and deaths than motor cars in the developed world. Motor vehicle accidents continue to be the leading cause of trauma in children in most reports, and are responsible for 26 - 40% of all trauma-related childhood deaths in Africa.[4]

In South Africa more than one-third (39.5%) of infant transport-related deaths and more than half (56.4%) of child transport-related deaths were the result of pedestrian injuries. Among children, the 5 - 9-year age category was the most at risk for passenger injuries.[5] Of all the non-natural deaths occurring in South Africa, at least 10% are persons under the age of 18 years.[5]

Trauma care at Red Cross War Memorial Children's Hospital

Although it is now widely recognised that systematisation of trauma care reduces mortality and improves outcome in Africa, especially sub-Saharan Africa, trauma systems hardly exist. The development of such systems is urgently needed and involve several levels of planning. This was first recognised by Professor S Cywes, the head of Paediatric Surgery from 1975 to 1997. As a result of his vision, a Child Safety Centre was established at Red Cross Hospital in 1978, according to international standards, with the initial aid of a R1 000 grant from the Urban Foundation.[6] It has played a pioneering role concerning safety issues for children in Africa, and its staff became actively involved in improving the care of injured children, with a particular focus on preventive care.

Plans to develop a trauma unit, specifically dedicated to children, were also developed, and a previous administrative corridor on the ground floor of the B wing of the hospital was transformed to house the unit, comprised of a treatment and resuscitation room, a fully fledged radiodiagnostic imaging room, two operating theatres and a paediatric high-care ward with 10 beds. The unit was officially opened on 24 April 1984 and a new paediatric trauma surgeon appointed, together with a paediatrician. The specialised paediatric trauma unit proved to be an immediate success and in the first 5-year period 57 468 patients were treated (Table I).

During the course of 1997 a new system of health care referrals was introduced in the Western Cape, leading to a rather acute decrease in the number of patients presenting to our Unit. This decline continued until 2000; since then, however, the numbers have been rising gradually. Although the absolute numbers declined after 1997, the number of major trauma cases (resuscitations) actually increased, probably as a result of the increasing population of Cape Town.

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Table I. Patients treated and operated upon at the Red Cross Trauma Unit (1984 - 2004)

Year	Patients treated	Operations
1984	11 178	507
1985	12 052	1 201
1986	12 860	1 064
1987	12 857	969
1988	12 923	921
1989	12 375	1 022
1990	14 892	912
1991	13 209	897
1992	12 461	778
1993	13 136	907
1994	14 780	1 397
1995	15 569	1 220
1996	13 473	951
1997	9 228	1 000
1998	8 752	1 013
1999	8 214	953
2000	6 923	861
2001	7 193	869
2002	8 050	829
2003	8 517	895
2004	8 798	892

Of all patients, 17.1% required admission. The majority of children presented to the trauma unit after a fall (43%), while other most common causes were bumps and blows (15%), transport-related injuries (11%) and burns (11%).[7]

In 2001, we performed a 10-year review, analysing the major causes of admission. Results are shown in Fig. 1. A total of 88 822 children were treated at the trauma unit in the period from 1991 to 2000. The most common injuries were falls (*N* = 32 766) (21%), transport-related injuries (*N* = 11 915) (13%), burns (*N* = 7 241) (8%), struck by or against an object (*N* = 9 064) (10%), foreign bodies (*N* = 3 677) (4%), sharp instruments (*N* = 3 601) (4%) and non-accidental injuries (*N* = 3 302) (3%).[8]

One of the strengths of close co-operation between the trauma unit and the Child Safety Centre was the opportunity to enter all paediatric trauma patients' details in the database at the Child Safety Centre. This made it possible to extensively study and analyse paediatric trauma, with the particular aim of designing effective accident-prevention programmes.

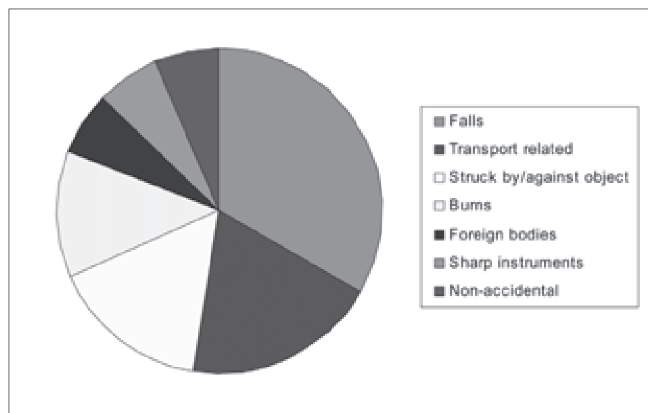

Fig. 1. Most common mechanisms of injury of patients admitted to the trauma unit (N = 88 822).

The new trauma unit at Red Cross Hospital

During the late 90s it was recognised that the transformed administrative corridor was not the ideal geographical location to have a busy trauma unit. In accordance with the international trend to have a single unit dealing with emergency medical care as well as trauma, plans were designed to develop a new trauma unit with direct access to the medical emergency unit. This has several advantages. There is no patient confusion. All emergency patients enter the same door, with both the medical and surgical resuscitation rooms in close proximity of the emergency entrance. Another advantage is closer co-operation between medical emergency staff and surgeons. Also, in case of a mass disaster the units can become seamless and overflow into each other.

With great help from the Red Cross Hospital Trust R17 million was fundraised within a record time, and the unit was opened in October 2004. The new unit consists of a vastly modernised resuscitation room, including digital radiological equipment, two state-of-the-art modern operating theatres

Fig. 2. The new Trauma Unit at Red Cross Children's Hospital.

Fig. 3. The digital whole-body imaging device (Lodox StatScan) in the resuscitation room.

and a trauma admission ward, double the size of the old unit. The surface area of the unit has increased by 100%, enabling treatment and resuscitations to be more effective. In the old trauma unit the distance between the specially manufactured paediatric cots was only 60 cm, while in the new unit the international standard of 1.8 metres was achieved. This provides the nursing staff with ample space to conduct their duties without being hindered by other patients or visitors. The new unit is also designed to be naturally lit by daylight rather than artificial light, providing the children with a pleasant environment in which to recuperate (Fig. 2).

Another valuable asset to the new unit is a digital whole-body scanner, the Lodox StatScan. This imaging device, located in the resuscitation room, is able to perform a whole-body radiological scan within minutes after arrival of the child in the Trauma Unit, at significantly lower levels of radiation as compared with conventional radiological imaging. This is of particular advantage when dealing with large numbers of paediatric polytrauma patients. It also highlights subtle fractures that may be clinically missed initially (Fig. 3).

Conclusion

Paediatric trauma care at our hospital has come a long way over the last 25 years, from practically being non-existent to an excellent, dedicated paediatric tertiary trauma centre, with a specialised surgeon present 24 hours a day. We can only hope that the care in other parts of the country will catch up soon.

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