Since the introduction of anaesthesia in 1846, millions of anaesthetics have been administered throughout the world, under varying circumstances, and by various anaesthetists.

The World Health Organization (WHO) has launched numerous projects and programmes, one of which is the Safe Surgery project. A fundamental requirement for this project is safe anaesthesia, “while protecting the patient from pain”.

Peter Gordon has elaborated on the Surgical Safety Checklist in this journal, and Iain Wilson discusses one component of the checklist in detail.

Clinical anaesthesia has been described as a state of “physiological trespass”, and “an indispensable adjunct to the surgical management of disease”. “The more injury and disease encroach on the body’s physiological milieu, the less anaesthetic encroachment can be tolerated, and accordingly, the clinical anaesthetist’s margin of error shrinks. At times, this poses an important risk to our patients.”

An adverse outcome during administration of an anaesthetic may result in morbidity or mortality. The latter provides us with the most fundamental measure of the safety of anaesthesia in our patients. It is essential that this is documented consistently and accurately.

In South Africa, we do not have adequate reporting structures to quantify anaesthetic-associated mortality, let alone anaesthesia-associated morbidity, despite the latter’s importance, and particularly from the patients’ perspective. It is also becoming increasingly important to include outcomes that affect economic issues, quality of life, and patient satisfaction.

Rates of death, solely due to anaesthesia, are sometimes difficult to ascertain, and studies reporting rates use varying definitions of deaths that are due to anaesthesia. What is clear is that anaesthetic-related mortality is rare. In previous studies in South Africa, mortality was estimated to have ranged from 1 per 2 (these were deaths reported in 1955, in which anaesthesia played a “role”) to 1.1 per 10 000 anaesthetics, where anaesthesia was considered to be solely responsible for the patients’ deaths.

The first documented Western world “anaesthetic-associated death,” or death directly attributable to anaesthesia, was reported in 1848 in the USA, when Hannah Greener died as a result of aspiration on induction with chloroform. The anaesthetic was given to her by the surgeon, Mr Meggison, who was going to “remove the nail from the great toe of her right foot”. Of interest is that an inquest was held, in which the jury decided that she died from “congestion of the lungs from the effects of chloroform”.

Since then, numerous studies have been published internationally on anaesthesia mortality rates.

These studies are often very difficult to compare, for many of the following reasons:

- There are no agreed definitions as to what constitutes “anaesthesia mortality”.
- There is no agreement over how much of the perioperative period to include (studies vary from 24 hours to two years).
- Frequently, the number of years to be covered by a particular study is unclear.

Mortality rates cannot be compared to assess whether mortality due to anaesthesia is improving. Each study needs to be examined individually.

In South Africa, the Medical, Dental and Supplementary Health Services Professions Act of 1974 states that: “The death of a person, while under the influence of a general anaesthetic or local anaesthetic, or to which the administration of an anaesthetic has been a contributory cause, shall not be deemed to be a death from natural causes, as contemplated in the Inquest Act, 1959 (Act 58 of 1959), or the Births, Marriages and Deaths Registration Act, 1963 (Act 81 of 1963)”. This statement has been amended in the Health Professions Amendment Act of 2007 to read as follows: “The death of a person undergoing, or as a result of, a procedure of a therapeutic, diagnostic or palliative nature, or of which any aspect of such procedure has been a contributory cause, shall not be deemed to be a death from natural causes, as contemplated in the Inquest Act, 1959 (Act 58 of 1959), or the Births, Marriages and Deaths
in these circumstances, a very small number of deaths to
to its difficulties and complexities. It is acknowledged that
desirable in some respects, would have added considerably
of a period after operation, although
cannot be become unmanageably large. Extension of this study to
death attributed to anaesthesia, without the study
of a period of 24 hours after anaesthesia is arbitrary. It
of death. The choice
is a death occurring, during, or within 24 hours of
anaesthesia, or after failure of a patient, conscious before,
to regain consciousness after anaesthesia. The choice
of a period of 24 hours after anaesthesia is arbitrary. It
embraces a period that is adequate to permit identification of
death attributed to anaesthesia, without the study
becoming unmanageably large. Extension of this study to
a surveillance of the whole period after operation, although
desirable in some respects, would have added considerably
to its difficulties and complexities. It is acknowledged that
in these circumstances, a very small number of deaths to
which anaesthesia was a major contributory factor, such as late deaths from aspiration and pneumonia, might have been missed”.
Harrison acknowledged the definition of “anaesthetic death” in its broadest sense, as well as in terms of South African law, but also acknowledged the associated shortcomings. His sentiments in arbitrarily choosing a period of 24 hours (in the setting of our current practice of voluntarily reporting of deaths due to anaesthesia) are understood, and the possibility of missing a small number of deaths is acknowledged.
Nevertheless, the two deaths to which anaesthesia contributed in a pilot study, and reported in a recently completed thesis, occurred after this 24-hour cut-off. Both these deaths were directly attributable to anaesthesia and the patients were fit and healthy preoperatively. Both of them never woke up after the anaesthetic and died within seven days of the start of the anaesthetic. In terms of Harrison’s definition, they were conscious before the operation and failed to regain consciousness postoperatively.
To date, the available data in published articles and official reports indicate that the risk of death attributable to anaesthesia has probably declined over the years. The reasons for this are not entirely clear. They may include new monitoring modalities, new anaesthetic drugs, and changes in the anaesthesia workforce. However, no study has shown improved outcomes with any one of these, including the advent of pulse oximetry. This limitation supports the need for ongoing audits and peer review of all of the complications relating to anaesthesia, with death being one extreme.
As a result of the confusion over the 24-hour cut-off period, and paired with ignorance about the law, the reporting of deaths to which anaesthesia has contributed in South Africa appears to have been erratic and “voluntary” over the years. As has happened with maternal deaths, legislation should probably be introduced to formally report such deaths in South Africa. This would ultimately lead to a process similar to the National Confidential Enquiry into Perioperative Deaths (NCEPOD) process in the United Kingdom, which would allow documentation of the deaths in the various hospitals, both government and private. As with the South African Saving Mothers reports, the shortcomings in the healthcare system that lead to some of these deaths could be identified, and ultimately, the number of deaths reduced. The aim would be safer anaesthesia, as measured by mortality, for all of our patients.
Christina Lundgren
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