

Presentations

FOR01: “Preventive Pathology”

Roger W. Byard, Professor of Pathology, The University of Adelaide, Adelaide, SA, Australia.

Injuries continue to account for a significant proportion of preventable childhood deaths despite international and national initiatives to improve the safety of children's environments. Although pathologists have not traditionally been involved in injury prevention they often have extensive knowledge of childhood injuries, and can contribute significantly to health promotion initiatives and community education programmes. Children who present “dead on arrival” or directly to the mortuary bypass the hospital system and so are often not included in the usual medical literature on unsafe childhood environments. In South Australia the “Keeping Your Baby and Child Safe Programme” is run from the state mortuary to enable monitoring of trends in accidental childhood death and to rapidly identify new dangers. Information obtained from these cases has already been used to formulate safety recommendations dealing with unsafe sleeping environments, unsafe eating practices, scalding, and dangerous farm environments, with the identification of potential dangers from overhead suspended rocking cradles, inflatable beds, mesh sided cots, stroller prams and “V” shaped pillows. Pathologists should be encouraged to contribute their often extensive knowledge of childhood accidents to health promotion initiatives, and groups involved in community education programmes should avail themselves of this expertise.

FOR02: **The medico-legal investigation of sudden, unexpected and/or unexplained infant deaths in South Africa: Where are we – and where are we going?**

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J Dempers, University of Stellenbosch
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Purposes: Sudden Infant Death Syndrome (SIDS) has been reported to be the leading cause of death in infants under one year of age in many countries. Unfortunately, a paucity of published research data exists in South Africa, with regard to the incidence of and investigation into the circumstances surrounding Sudden Unexplained Deaths in Infants (SUDI) and/or SIDS. Currently, even though most academic centers conform to a protocol consistent with internationally accepted standards, there exists no nationally accepted infant death investigation protocol in South Africa. It is the aim of this study to review the current practice of infant death investigation in two representative but geographically and demographically distinct centers.

Methods: Retrospective case audit over a five-year period (2000 to 2004) was conducted at two large medico-legal mortuaries in Pretoria (Gauteng) and Tygerberg (Cape Town). Case files on all infants younger than one year of age were reviewed.

The outcome measures included number of deaths, demographic details and the nature and final outcome of the post mortem examinations.

Results: A total of 512 cases were identified as possible SIDS cases and of these, 171 was classified as SIDS. The study showed marked inter-case and inter-divisional variation in terms of the investigation of infant deaths at the two institutions.

Conclusions: It is envisaged that this study will focus attention on the current lack of usable data regarding sudden/unexplained/unexpected infant deaths in South Africa, and aid in the formulation and implementation of a practical (yet internationally accountable) infant death investigation protocol, which could facilitate comparisons with other countries and initiate further structured research in this field.

FOR03: Profiling the approach to the investigation of viral infections in cases of Sudden Unexpected Death in Infants (SUDI) in the Western Cape Province

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Sudden Unexplained Death in Infancy (SUDI) refers to any sudden demise in a child. If no conclusive cause of death can be ascertained by means of complete autopsy and investigation into the circumstances surrounding death, such a case is classified as one of Sudden Infant Death Syndrome (SIDS).

There can be little doubt that viral infection can be a contributory factor to death in cases of supposed SUDI. At the Tygerberg medico-legal laboratory, the evaluation of lung tissue for the presence of viral lung infections forms part of the protocol for the examination of SUDI cases. Lung samples of these SUDI cases are routinely tested for the presence of Cytomegalovirus, Respiratory Syncytial Virus and Adenovirus by means of shell vial cultures. In a retrospective study of 366 SUDI cases from Tygerberg Hospital, Western Cape from 2004 – 2006, it was evident that only 13.9% of possible SIDS cases tested positive for one or more of the aforementioned viruses. We hypothesise that this method of virus detection might not be optimal in terms of sensitivity and specificity in reporting that viral pulmonary infection is a contributory factor to death in infancy. As other test modalities exist for the diagnosis of pulmonary viral infection, these methods were compared for sensitivity and specificity.

Eighty-two samples were collected over an 8 month period and routine shell vial cultures were done, followed by real-time PCR, and immunohistochemical staining of the lung sections and consensus pathology opinion. As was expected, it was found that the real-time PCR method is thus far much more sensitive in identifying positive samples than shell vial method (~30% vs ~4.5% respectively). We expect the findings to be instrumental in streamlining not only our institutional SIDS investigation

protocol, but also the development of a standardised national SIDS investigation protocol.

FOR04: Early neonatal deaths attributed to viral encephalomyocarditis and pancreatic islet cell necrosis in twins – collaborative autopsy findings clarifies cause: case report

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Dr Johan Dempers, Division of Forensic Medicine, University of Stellenbosch
Dr Michael Locketz, Division of Anatomical Pathology, Groote Schuur NHLS / University of Cape Town
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We report on an interesting situation of early twin neonatal deaths attributed to viral type myocarditis and meningo-encephalitis with pancreatic islet cell necrosis. The autopsies were conducted at different institutions in the Western Cape. Although a number of viruses are known to cause islet cell necrosis, several studies have shown that Enteroviruses, and more specifically Coxsackievirus B infection, induce the triad of myocarditis, meningo-encephalitis and insulinitis. Despite lack of positive culture or serological evidence in these cases the possibility of transplacental transmission of a maternal Enterovirus infection cannot be excluded.

For public health epidemiological purposes recognition of the infective agent is important in these cases. Alternatively one should at least attempt to prove specific necrosis of islet beta cells. Such investigation requires specific immunohistochemical analyses or sophisticated genomic tests.

The possibility of acute Type I diabetes secondary to insulinitis as a result of necrosis of islet beta cells, must be considered as a possible mechanism of death. Literature reports have indicated that up to 30% of patients with acute onset Type I diabetes mellitus have IgM antibodies against particular serotypes of Coxsackievirus B. Our report is particularly remarkable due to the fact that neonatal diabetes is estimated to occur in only 1: 400 000 live births.

FOR05: Is the Brain Abnormal in Infants or Toddlers with Sudden Death?

Hannah Kinney, Department of Pathology, Children's Hospital Boston and Harvard Medical School, Boston, MA, USA

The questions facing the pathologist upon examination of the brain of an infant or toddler who has died suddenly and unexpectedly are: 1) is there a brain lesion that explains sudden death?; 2) if not, is there a brain lesion that reflects a systemic process that explains sudden death?; and 3) is there a brain lesion that, if not directly causative, provides insight into the pathogenesis of sudden death? Brain lesions responsible for sudden death in early life include traumatic hemorrhages and infectious processes. Brain lesions indicative of a systemic process include white

matter pathology that complicate inborn errors of metabolism. Certain microscopic brain lesions with the light microscope in infants dying of the sudden infant death syndrome (SIDS) are likely secondary and provide potential clues to its pathogenesis, including diffuse gliosis of the cerebral white matter and brainstem and periventricular leukomalacia. These lesions suggest a role for perinatal and/or chronic/episodic hypoxia-ischemia in SIDS. The light microscope may also reveal subtle lesions in SIDS that suggest causative mechanisms. Hypoplasia of the arcuate nucleus at the ventral surface of the medulla in SIDS cases is known to be associated with wider brainstem neurotransmitter deficits related to cardiorespiratory control. The arcuate nucleus encompasses the putative respiratory chemosensitive fields involved in chemosensitivity to carbon dioxide. In toddlers (1-5 years), abnormalities of the hippocampus are associated with sudden death, and include gross asymmetry and multiple microdysgenetic features. A lethal, sleep-related seizure originating within an epileptogenic focus in the hippocampus is postulated. Taken together, this information indicates that a systematic examination of the brain is essential in the evaluation of sudden death in infants and toddlers at autopsy.

FOR06: Inflicted Head Injuries In Children And The Courts

Roger W. Byard, Professor of Pathology, The University of Adelaide, Adelaide, SA, Australia.

The evaluation of head trauma in infants is often complex and contentious. Difficulties arise at all levels and problems result from inadequate investigations, poorly documented autopsy findings and contradictory interpretations of lesions. Head injuries in infants are particularly difficult to evaluate given a paucity of external findings, unique anatomy and poorly understood mechanisms of initial injury. Double blind trials involving head injury in infants are not possible, and animal and mechanical models have been criticised. The older literature often relied upon uncorroborated histories of injury, and extrapolation was often made from small numbers of cases. The role of the expert is unenviable. Opinions are requested on the degree of force required to cause injuries and on possible mechanisms, resulting in protracted debate over possible contributions of factors to the fatal episode. If an infant or young child has died from a head injury that is not explainable by carers or by a close analysis of the environment where the child was injured, inflicted injury must be strongly suspected. The evaluation of these cases requires full scene examination by trained investigators, careful review of the family and infant's history, complete autopsy by a forensic pathologist with experience in pediatrics (or by a combination of forensic and pediatric pathologists), adequate tissue sampling and full neuropathological evaluation of brains and spinal cords by a specialised neuropathologist, with the use of special stains for evidence of occult trauma or disease. Defects in any of these areas may make subsequent medicolegal evaluation difficult, if not impossible.

FOR07: Giving Evidence

Caron Mary Lehmann, Head of the Civil Section of the Magistrates' Court, Cape Town.

The discussion will commence with an examination of the difference between a criminal trial, a civil trial and an inquest. The practicalities of giving evidence in each of these procedures will be canvassed. This will include considering the role of the judicial officer, the public prosecutor, the attorney, the witness and the expert witness. In particular, the different functions of a medical witness will be explained as well the approach of the courts to the reception of this evidence.

FOR08: The medico-legal investigation of abandoned babies, abortuses and other products of conception

Lorraine du Toit-Prinsloo, Department of Forensic Medicine, University of Pretoria

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Several issues are pertinent with regards to the management of products of conception (foetuses, embryos and neonates) in South Africa. The most important is that there is no legal definition for viability of an infant in the South African legal system. The only term in relation to this topic defined by South African Law is that of a stillborn baby.

According to literature from the United Kingdom only a minority of suspicious cases regarding products of conception deaths ever reach a court of law and if there was a conviction, little if any steps are taken. Currently there are no clear protocols for the management of these cases in South Africa.

Other countries give the right to burial of the infant regardless of the gestational age. In terms of South Africa Law, you should have a burial order before remains can be buried/cremated and this can only be issued when a death notification form was completed.

This study was conducted at the Pretoria Medico-Legal Laboratory over a five year period. The aim was to determine the magnitude of the problem, gestational age, demographic details, extend of examination done, cause of death and whether or not a death notification form was completed. The “disposal” of the remains was also assessed.

The results of a pilot study showed that these cases comprise 3% of the total case load. Most of these were between 20 – 23 weeks of gestation. A full post mortem examination were conducted on 37% of the cases, histology was done in 17% of cases and samples for DNA analysis were retained in 17% of cases. The pilot study showed discrepancies in the examination of these cases and in the completion of the death notification forms. The results of the 5-year study will be presented at the congress.

FOR09: Collection of cases from the Eastern Cape

Dr Annemarie Mattheus, Forensic Pathology Services Dept of Health Eastern Cape

Presentation of a few interesting cases seen in Port Elizabeth. After relocating from Johannesburg to Port Elizabeth in 2007, it became clear that there are cases in Port Elizabeth that differ from any previous cases that I had been involved with in Gauteng.

The following cases will be discussed:

- Sudden death of an elderly man who presented to the hospital after an alleged snake bite. At post mortem, the cause of death was determined to be anaphylaxis caused by the snake bite antivenom administered in the hospital.
- Two cases of sea drownings with post mortem shark injuries, consistent with great white shark attacks.
- An elephant carer was trampled to death by the elephant that he had cared for for many years.

The abovementioned cases are cases that can only be seen in certain areas of our country, however any specialist should be able to perform the medico-legal post mortems.

FOR10: 'trauma care in SA: How to do a lot with a little'

Denis Allard, GF Jooste Hospital

The ten leading causes of premature mortality in SA are championed by HIV/Aids followed by trauma. Cape Town is the highest crime rate city in the second highest crime rate country on the planet. What lessons can SA trauma surgeons teach the world when it comes to trauma management? How can one achieve reasonable outcome results in an overwhelmed system?

This presentation was given as a keynote address at the European Society for Trauma and Emergency Surgery congress in Brussels in May 2010. It uses the mortuary figures of penetrating injury deaths from both Cape Town mortuaries from the last three years.

FOR11: An unusual case of acquired Empty Sella Syndrome secondary to Sheehans Syndrome with the added finding of a left atrial myxoma

Dr. Akmal Khan, University of Cape Town, Dept of Forensic Medicine

Background: The unusual finding of an empty sella with a left atrial mass

History: A case of a 32 year old female referred for autopsy following unexplained death in hospital within 24 hours of admission. Patient presented with hypoglycaemia (Vx=1.1mmol/l, normal 4-7mmol/l) and history of catatonia. The patient had a background history of post-partum depression, and is on amitriptyline and secondary amenorrhoea.

On admission to hospital, she was found to have sparse axillary and pubic hair with a depressed affect. All system examinations were normal with no focal neurology.

Blood were taken and she was admitted to the ward for glucose correction and started

on hydrocortisone. The patient found discovered dead in the early morning by the nurses.

At autopsy: She had hyperpigmentation of the skin, an empty sella with pituitary stalk present, a small thyroid gland, adrenals and ovaries. There was a 58gram organized mass attached to the left atrial septal wall.

At microscopy: There was residual pituitary tissue flattened against the posterior sella floor with herniation of the intracranial subarachnoid membrane into the sella which are in keeping with empty sella syndrome secondary to haemorrhage and subsequent fibrosis and atrophy of the pituitary gland.

The ovaries showed advanced stromal fibrosis with scanty ova present consistent with premature ovarian atrophy. There was extensive cortical fibrosis extending from the capsule in the adrenal gland.

There was an encapsulated mass attached to the left atrial septal wall with stellate mesenchymal cells with elongated nuclei surrounding vascular channels. There was a positive Alcian blue stain for sulphated mucopolysaccharides confirming a left atrial myxoma.

Discussion: The unusual presentation of Sheehans Syndrome with subsequent atrophy of the pituitary gland leading to an empty sella presenting in a form of sudden death and the relationship between added the finding of the left atrial myxoma.

FOR12: "Hey Tarantino! Show me Your pituitary!" Evaluating the feasibility of student-generated video material in postgraduate forensic pathology training

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Juanita Bezuidenhout, Division of Anatomical Pathology, University of Stellenbosch & National Health Laboratory Services

The Colleges of Medicine of South Africa is earmarked to become the unitary specialist exit examination body for all postgraduate students. Subsequently, all students in forensic pathology will be required to submit logbooks of practical work and portfolios of learning, in which detail of practical learning experience in topics such as anthropology, odontology, blood splatter analysis, firearms/ballistics/tool marks, and autopsy technique is contained. No specifications exist for the format of the logbook and portfolio yet, but it is expected that these are to be presented in a paper-based format, as is the current accepted norm. In a practically orientated environment such as Forensic Pathology, the objectivity and validity of a paper-based logbook and portfolio system is questionable, because it will always fail to address all important markers in the assessment process.

Three themes were addressed in questionnaires to all actively practicing consultants and all registrars in Forensic Pathology in South Africa: 1. The level of knowledge regarding scholarship of teaching in Forensic Pathology, 2. the assessment characteristics of individual postgraduate education programs, and 3. individual skill

in using technology to incorporate student generated video as part of the process of portfolio compilation and formative assessment.

A scholarship of teaching and learning is not well developed in Forensic Pathology. Wide scale implementation of a video-based portfolio system is feasible, but may be constrained by limited technical expertise. Most respondents were optimistic about the concept.

If the technical challenges can be solved, student-generated video-based portfolio is a feasible and appropriate method of representing technical skill and learning for post graduate students.

FOR13: Non-collision vehicular fires - A case report and literature review

Steven Afonso, Division of Forensic Medicine and Toxicology UCT

Fire associated deaths are fairly common in forensic practice. They are often associated with extensive burn injuries or even charring, as is common with vehicle fire victims. Determining the cause of death is paramount, but may pose a diagnostic dilemma for pathologists, especially when there are minimal or no external injuries present, and particularly when the toxicological analysis does not provide conclusive results.

The majority of vehicular fires are the results of collisions or accidents, but are on occasion the result of electrical or mechanical faults. The confined space and variety of combustible materials within modern vehicles, pose a serious risk to occupants, especially children, in the event of a fire.

This presentation is a case study discussing a fatal electrical vehicle fire, which resulted in the death of a child with minimal external injuries and a low carboxyhaemoglobin concentration. It serves to highlight the difficulties in determining the cause of death, the importance of interdisciplinary cooperation in achieving this goal, and also to provide an overview of the possible causes of death in such instances.

FOR14: The Evolution, Faltered Evolution, and De-Evolution of American Death Investigation

Brad Randall, Professor of Pathology, South Dakota Sanford School of Medicine

The origins of American death investigation are rooted in the medieval English Common Law Coroner, a position created primarily to collect taxes and not investigate deaths. The North American colonies were established during the nadir of the colonial system.

While English death investigation slowly improved subsequent to the American revolution (perhaps influenced by the far better systems of death investigation of their

Continental cousins), death investigation in the US fell victim to “democratization.” In the US, the enlightenment of the post-revolutionary era taught that the “people” were the best judges of who should serve them as coroners and sheriffs.

While there were many fine elected coroners, many (often in the most populous areas) became political hacks, using the coroner position for fraud and political advancement.

Coroner corruption was caught up in the general corruption running rampant in larger US metropolitan areas of the US in the late nineteenth and early twentieth centuries. The public outrage that swept many of these corrupt big city bosses from power also ushered in the appointed expert medical examiner.

During the first half of the twentieth century, the golden era for advancement of the medical examiner system, medical examiners slowly replaced coroners in the larger cities. By the early 1960’s approximately 60% of the US population was served by a medical examiner system of death investigation.

The hoped for elimination of the coroner system however not only didn’t happen, the expansion of the ME system faltered and began to inch backwards. The failure of the ME system to advance has been driven by a lack of trained forensic pathologists, the uncanny ability of prominent medical examiners to politically self-destruct, and the pernicious political clout of the elected coroner.

FOR15: Crush syndrome without the crush? A case study and review of the literature

Elsie Burger, Division of Forensic Medicine, Stellenbosch University and Forensic Pathology Services, Tygerberg

Case study: A 30 year old male was admitted to hospital after having been assaulted. He suffered a laceration to the scalp, a peri-orbital haematoma, and a base of skull fracture. Four days after admission, acute renal failure and “Crush syndrome” was diagnosed, in spite of the absence of extensive soft tissue injury. The patient died 11 days after admission.

At autopsy the base of skull fracture was found to continue into the sella turcica, and avulsion of the pituitary gland was present. The kidneys showed acute tubular necrosis with many, large granular casts in the tubules. An immuno-histochemical stain for myoglobin was positive in these casts.

Discussion: Rhabdomyolysis (RML) is a clinical and laboratory syndrome characterized by muscle necrosis and release of intracellular muscle constituents into the circulation. Common causes of RML include trauma, drugs, hyperexertional states, and muscle compression, while the hyperosmolar state associated with diabetic coma has also been discussed as a less common cause of RML. In fact, recent findings suggest that any hyperosmolar state, as could be caused by Diabetes Insipidus or even mannitol infusion, could lead to RML. Initially these patients might have a low potassium level, but when renal failure develops due to myoglobinuria, hyperkalemia is typical.

Conclusion: Symptoms and signs of “Crush syndrome” might develop in the absence of severe soft tissue injury. In these cases the cause of the rhabdomyolysis (with or without hyperosmolarity) should be sought. Specifically the possibility of pituitary injury must actively be investigated.

FOR16: Aluminium Phosphide (Tank pill) poisoning in the Transkei region of South Africa. A case report

Banwari Meel, Walter Sisulu University

About half a million people die each year as a result of various kinds of poisoning. The incidence of pesticides poisoning, which is high in developing countries, has doubled during past 10 years (WHO, 2006). Aluminium phosphide is a deadly poison, available in solid form as a fumigant pesticide. A 21-year-old man committed suicide by ingestion of aluminum phosphide, which was available victim's home. He was charged with rape, and has to appear in court. Soon after ingestion, he told to his grand mother, and they took him to nearby hospital, where he was died within an hour. Internal organs were congested. The mechanism of action, symptoms and signs were discussed in this report. Preventive measures are suggested.

FOR17: Sudden Natural Death in Adults: A Forensic Perspective

Mary Ann Sens, Professor and Chair of Pathology at the University of North Dakota

The investigation of sudden death is a cornerstone of activity in forensic pathology and forensic investigations. Through case vignettes, three areas of natural disease and forensic pathology are considered. First, unsuspected natural disease may affect forensic investigations, affecting the both the course and resolution of these investigations. Secondly, a large variety of public health risks and problems may be uncovered by sentinel forensic investigations into sudden death. Third, the role of forensic pathology in providing critical family health issues is discussed.

FOR18: “Eye spy”

Linda Liebenberg, Division of Forensic Medicine and Toxicology UCT

Unnatural deaths where the eye is the chief or a major site of lethal pathology is uncommon unless associated with other significant injury to vital structures.

Two cases where the eyes played a role in causation of death will be presented. Case A died very suddenly during an intra-ocular operation for choroidal melanoma. Case B died during an unwitnessed interpersonal altercation in police custody. In both cases the autopsy findings were surprising.

Presentation of the autopsy findings and clinico-pathological correlation will be expanded by X-ray findings and photographs, followed by a discussion of possible mechanisms of death.

Key words: Air embolism. oculo-cardiac reflex, eye gouging

FOR19 Understanding heat stroke: 4 case presentations

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Linda Liebenberg, Division of Forensic Pathology University of Cape Town

Heat stroke is categorized as an unnatural death. Conclusive diagnosis can prove challenging and requires a high index of suspicion and clinico-pathological acumen.

Four autopsy cases will be presented with the discussion focusing on:

- * Circumstances inducing heatstroke
- * Predisposing factors
- * Clinical presentation
- * Autopsy pathology
- * Histological findings
- * Pathogenesis and formulation of the cause of death.

FOR20 Sudden and unexpected deaths in adults: an investigation into cases over a 5-year period from 2001-2005 at Tygerberg Medicolegal Laboratory

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Elsie Helena Burger, Division of Forensic Medicine, Department of Pathology, Faculty of Health Sciences, University of Stellenbosch

Background - The primary aims of the medico-legal autopsy are limited to establishing a cause of death in presumed unnatural cases, and to exclude criminality or negligence. The workload of the forensic pathologist and Forensic Pathology Services staff is increased by the referral of potentially unnecessary natural cases to the Forensic Pathology Services.

Objective – To determine the final outcomes of forensic post-mortem examinations in “sudden and unexpected” adult deaths over a 5 year period.

Methods - An observational, retrospective, descriptive study was conducted. “Sudden and unexpected” adult deaths referred to Tygerberg Forensic Pathology Services between 1 January 2001 and 31 December 2005 were reviewed. Data was collected from the autopsy reports, contemporaneous notes and hospital records.

Findings – A total of 816 adult cases of sudden and unexpected death were reviewed. Complete autopsies had been performed in 74% (601/816) of cases. The manner of death was natural in 79.04% of cases, and an increase in the number of presumed natural cases per year was noted over the 5-year study period. The mean age was 42.55 years and males comprised 68% (561/816) of cases. Diseases of the cardiovascular, respiratory and central nervous systems were responsible for the majority of presumed natural deaths in all age groups, but infectious diseases topped the list in the youngest age group studied (18-29 years). Acute alcohol poisoning was responsible for the deaths of 35 (6%) cases, with an average blood alcohol concentration of 0.38g/100mL in these cases. Eight deaths were related to other drugs/substances. Waiting times for blood alcohol and toxicology results increased over the 5-year study period.

Conclusions -The questionnaire and interviewing structure could possibly be improved in order to obtain better pre-autopsy information and to reduce the number of “unnecessary” autopsies.

FOR21: Developmental Neuropathology of Interest to the Forensic Practitioner

Rebecca D. Folkerth, Director of Neuropathology, Brigham and Women's Hospital

In addition to expertise in matters related to trauma in the infant or child, Forensic Pathologists must have a solid understanding of other important diseases of the immature nervous system in order to render proper determinations of the cause and manner of death. Specifically, recognition of normal cell populations and processes across development, and of disorders particular to young subjects, is needed. This presentation will briefly review general features of normal nervous system development, and then focus upon recognition and work-up of selected malformative, infectious, and hypoxic-ischemic lesions of the brain in infancy and childhood of relevance to the forensic practitioner.

FOR22: Validation study of cause of death statistics in Cape Town, South Africa, found poor agreement

Lené Burger, Division of Forensic Medicine, Stellenbosch University and FPS Tygerberg

Pam Groenewald, Burden of Disease Unit, Medical Research Council SA

Debbie Bradshaw, Burden of Disease Unit, Medical Research Council SA

Alison Ward, Department of Primary Health Care, Oxford University

Pat Yudkin, Department of Primary Health Care, Oxford University

Jimmy Volmink, Stellenbosch University and SA Cochrane Centre, MRC

Objective:

The validity of the underlying cause of death on death notification forms was assessed by comparing it to the underlying cause determined independently from medical records.

Study design and setting:

Retrospective study of 703 deaths in two suburbs of Cape Town, South Africa. Two medical doctors completed a mock death certificate after review of the medical records for each decedent. Agreement, sensitivity and positive predictive value were measured for underlying causes of death by ICD chapter and single burden of disease cause.

Results:

Agreement was poor, with only 53.9% (95% CI: 50.2-57.6%) of diagnoses matching at single cause level. Validity of reported causes of death was poor for HIV, cardiovascular diseases and diabetes. With correct reporting the cause-specific mortality fraction for HIV increased from 12.0% to 18.4% (53.6%; 95% CI 36.9-77.6%), for ischaemic heart disease from 3.3% to 7.3% (121.7%; 95% CI 53.5-228.7%), and for hypertensive disease from 3.3% to 5.7% (73.9%; 95% CI 14.4-167.8%). For diabetes the mortality fraction decreased from 6.0% to 2.1% (64.3%; 95% CI 37.8-77.1%) and for ill-defined deaths from 7.4% to 2.1% (71.2%; 95% CI 53.7-82.5%).

Conclusion:

Current cause-specific mortality levels and trends should be cautiously interpreted. Training in death certification is required to improve the validity of mortality data.

FOR23: Fatal incarcerated, post-traumatic diaphragmatic hernia- two cases of missed injury

Karisha Claudia Quarrie, Division of Forensic Medicine, Stellenbosch University and FPS Tygerberg

Elsie Helena Burger, Division of Forensic Medicine, Stellenbosch University and FPS Tygerberg

Post traumatic diaphragmatic hernia is an uncommon, yet well recognized entity in medical literature; however the diagnosis is often missed, especially in cases with delayed presentations, often with fatal consequences.

In the literature bowel obstruction with incarceration is often attributed to volvulus or carcinoma; however in populations where trauma is prevalent an additional important consideration is post-traumatic hernia. Here we present two cases of delayed traumatic hernia presenting with strangulation. One subject sustained blunt trauma in a motor vehicle accident and presented three months following the initial injury. In the second case the subject presented 6 years following a precordial stab wound. In both cases the diagnosis of traumatic diaphragmatic injury was missed in both the acute and chronic setting. We look at the correlation of clinical signs and progression with findings at autopsy and histological examination. .

In a single reported case, marked tissue autolysis prevented further assessment of the possible ischemic changes in the herniated intestine. Although post mortem herniation due to excessive putrefaction may have occurred with resultant gaseous distension and migration of intestine it was not possible to exclude it as an artifact of

putrefaction in a predisposed individual. It is therefore important that histological tissue specimens are obtained so as to recognize the chronology of the herniation.

This condition is probably under-reported and is often misdiagnosed as a natural cause of death, especially in older patients and where a previous history of trauma has been disregarded. We highlight the importance of early case referral for forensic autopsy due to the serious medico-legal consequences.

POSTERS

PFOR01: Suicidal tandem gunshot wound to the head - A case report

Steven Afonso, Division of Forensic Medicine and Toxicology UCT

Tandem gunshot wounds are clinically rare occurrences. The phenomenon is usually the result of either faulty ammunition or a defective firearm, which results in two bullets travelling in unison, typically nose to base. There have been a number of cases reported in English literature, but only two which have described suicidal tandem bullet wounds to the head. This case reports on one such suicide, where two gunshots were discharged the second being the tandem bullet comprising a metal jacket and a complete semi-jacketed round.

The case emphasises the value of radiology and photography in aiding diagnosis and providing accurate documentation of such cases. It also highlights the importance of inter-disciplinary co-operation when investigating both tandem and multiple gunshot wound cases.

PFOR02: A Medical Curiosity: Cardiovascular Syphilis - A Case Report

Lemaine Fouche, Dept of Forensic Medicine, Faculty of Health Sciences, University of the Free State, Bloemfontein

Virtually all forensic pathologists deal not only with criminal, suspicious, accidental and suicidal deaths, but with a wide range of deaths from natural causes of which most are sudden and unexpected.

In sudden death, the immediate cause is almost always to be found in the cardiovascular system.

Syphilitic aneurysms develop in the tertiary stage of the illness and are now uncommon because of the treatment available.

A case report will be presented; that of a 47 year old black female who died suddenly and unexpectedly.

During autopsy a pericardial tamponade (720 ml of blood) as well as an aneurysm of the ascending aorta with a 8 mm horizontal tear just above the aorta valve was noted. The aneurysm was sampled for histology which revealed the typical appearance of syphilis.

PFOR03: An investigation into the accuracy of skull-photo superimposition in a South African sample

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One of the aims of forensic science is to determine the identities of victims of crime. In some cases the investigators may have ideas as to the identities of the victims and in these situations, ante mortem photographs of the victims could be used to try and establish their identities. This may be done through skull-photo superimposition. The aim of this study was to evaluate the accuracy of a newly developed digital photographic superimposition technique on a South African sample of cadaver photographs and skulls, from the Pretoria Bone Collection. Forty facial photographs were selected and for each photo, 10 skulls (including the skull corresponding to the photo) were used for superimposition. The investigator did not know which of the 10 skulls corresponded to the photograph in question. The skulls were scanned 3-dimensionally, using a Cyberware™ Model 3030 Colour-3D Scanhead scanner. The photos were also scanned for superimposition to be done using the 3D Studio Max programme. The superimposition in 3D Studio Max involves a morphological superimposition, whereby a skull is superimposed over the photo and assessed for a morphological match. A superimposition using selected anatomical landmarks was also performed to assess the match. A total of 400 skull-photo superimpositions were carried out using the morphological assessment and another 400 using the anatomical landmarks. In 85% of cases the correct skull was included in the possible matches for a particular photo using the morphological assessment and in the landmark based assessment, the correct skull was included in 80% of cases. A total of 97.5% of correct skulls were included when both methods were combined. This study indicates that skull-photo superimposition has limited use in the identification of human skeletal remains, but may be useful as an initial screening tool. Corroborative techniques should be used in the identification process.

PFOR04: Case presentation: Death in custody - double suicide by incomplete hanging

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Introduction:

On the 27th of August 2008 at 16h30, the bodies of two awaiting-trial prisoners were discovered in the Randburg Police Station holding cells. The bodies were found hanging side-by-side in the latrine area of the cell. The deceased persons had simultaneously committed suicide by incomplete hanging.

Methods and results:

Collection of data - case review of the official South African Police Service Docket including the forensic pathology medico-legal investigation.

The case presentation will be presented in a poster format.

Conclusion:

An unusual case of death in custody via simultaneous incomplete suspension hanging is presented.

PFOR05: Lymphangioliomyomatosis: a case report and review of the literature

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We present the case of a 35 year old woman who suffered repeated spontaneous pneumothoraces during pregnancy. A CT scan of the chest demonstrated a honeycombed appearance of the lungs, with a multitude of thin-walled cysts.

A lung biopsy was performed, and microscopy of the lung tissue revealed widespread, well-defined nodules, composed of spindle-shaped cells, mostly in the peribronchiolar areas. Breakdown of the alveolar walls was present, with resultant cyst formation. Immunohistochemistry confirmed positive staining for smooth muscle markers (SMA, Vimentin and Desmin), melanocytic marker (HMB-45), and estrogen and progesterone receptors. These findings are typical of Lymphangioliomyomatosis (LAM).

Lymphangioliomyomatosis (LAM) is a rare but serious disease, with a poor prognosis. This condition occurs almost exclusively in women of reproductive age, and is all the more tragic due to its propensity to present or exacerbate during pregnancy. It is defined pathologically by “Widespread interstitial infiltrate of immature short spindle cells, resembling smooth muscle, usually associated with cystic change, most common in women of reproductive age.” The nature of these spindle cells remains obscure, although it has been suggested that they originate from perivascular epithelioid cells.

Most cases of LAM are sporadic; however, the disease has an interesting relationship with Tuberous Sclerosis Complex (TSC), with which it may overlap. Angiomyolipomas of the kidneys are common in LAM – which is one of the extracerebral manifestations of TSC. Many have the skin manifestations of TSC as well. TSC, however, occurs in both men and women, and has an autosomal dominant pattern of inheritance not seen in LAM.

Our case demonstrates the typical features of a condition which, despite its rarity, should be considered by clinicians and pathologists in the differential diagnosis of recurrent spontaneous pneumothoraces in women of childbearing age.

PFOR06: Prevalence and Patterns of Stab wound related fatalities in Transkei region of South Africa

RP Kaswa, Walter Sisulu University

Background: Penetrating trauma injury is a serious burden to societies and it is the leading cause of death and disability worldwide. Sharp force injury appears to have become more frequent and serious in South Africa. Sharp force injury is the second leading cause of death after firearms related death in South Africa.

Objective: To determine the prevalence of stab wound related fatalities as well as to recognize the patterns of stab wound according to Anatomical site.

Materials and methods: A retrospective research was conducted over a period of 2 years extending from 1st January 2005 to 31st December 2006 in the mortuary of Umtata General Hospital. For the present study the Death Register records that mentioned stab wound as manner of death were used to collect various demographic data.

Result: There were 2756 autopsies done during the 2 years period and 484 (17.59%) were victims of stab wounds. Of this Thorax is the region most often involved 315(73.55%) followed by head and neck 67(14.67%), abdomen 19(4.35%), Upper and lower limbs 3(0.83%), Multiple sites 26(6.61%). A majority of them 305(63.02%) are in the age group of 16–30 years.

The highest number of case were reported from Mthatha 229(47.31%) and majority of them were noted during December month 87(17.98%) A male predominance stab wound fatalities were noticed with 430 (88.85%) males, 54 (11.15%) female victim and majority of them 423 (87.40%) were unmarried.

Conclusion: There is high prevalence of stab wound related fatalities and thoracic region is the commonest site for stab wound related fatalities in the Transkei region of South Africa.

PFOR07: A Case Report on Near Manual Strangulation and Glasgow Coma Scale

Banwari Meel, Walter Sisulu University

Thousands of women are raped and strangled each year in South Africa. The human neck is a uniquely vulnerable to life-threatening injuries especially during sexual assaults. Perpetrators generally overpower women by compression of the neck. This is because of the fact that neck is small in diameter, lacks bony shielding and is in close

vicinity of vital structures such as trachea, spinal cord and blood vessels to and from the brain. Survival from strangulation is uncommon, and if it occurs, it is often associated with various complications such as neurological consequences. This is a case report of young female adult who was raped and manually strangled by a colleague during a training course for traditional healers. She was admitted with very low (3/15) Glasgow Coma Scale (GCS) and presumed to have a poor prognosis. She was rigorously ventilated in Intensive Care Unit (ICU), and was discharged from hospital after a week without any complications. The neck and genital injuries are described. This report discusses Near- manual- strangulation with low Glasgow-coma- scale and survival of victim without any neurological deficits.

PFOR08: A profile of non-natural deaths in the Mthatha area of South Africa

Banwari Meel, Walter Sisulu University

Background: Non-natural deaths are more common in developing countries, including sub-Saharan Africa and are on the increase. Most of these deaths are traumatic in origin such as by firearms, stabs, assaults and road traffic collisions (RTC). A small number are related to burns, hanging, fall from height, drowning, and poisoning. HIV/AIDS pandemic has taken away the focus from preventing non-natural deaths, as it has become a bigger problem.

Objective: To estimate the non-natural deaths in Mthatha area of South Africa.

Method: This is a retrospective review from the data collected at Mthatha Hospital Mortuary between 1996 and 2005. The age, gender and the cause of death have been recorded. Using SPSS statistical program, data were analyzed.

Results: There were 9304 non-natural deaths referred to the mortuary for autopsies between 1996 and 2005. The mean age of subjects was 32.7 years. The mean age of male victims was 32.2 years while in females, 34.9 years and this difference was statistically significant ($P < 0.001$).

The average rate of non-natural deaths was 229 per 100 000 population. It has a declining trend from 215 per 100 000 in 1996 to 192 per 100 000 in 2005. Male deaths are out of proportion to females in a ratio of 3.7: 1. Most of these deaths (23.26%) were between 21 and 30-year age group. It is a surprising fact that a high (7.3%) percentage of children under the age 10 years have also died unnaturally. Trauma was the main cause (76.7%) of this mortality. Of this, homicides accounted for 49.9% of the deaths (firearms in 23.2%, stab wounds in 16%, and assault in 10.7%). Road Traffic Collisions contributed to 26.8% of deaths.

Conclusion: Non-natural traumatic deaths are higher among males in the younger age groups.

PFOR09: A retrospective analysis of the use of the Lodox Statscan at the Salt River Forensic Pathology Laboratory

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The Statscan (Lodox Systems Pty (Ltd), Sandton, South Africa) is a low-dose digital radiography machine designed for use in trauma centers. Its ability to produce full-body images in seconds has the potential to assist pathologists in the location of bullets, shrapnel, traumatic injuries and pathology. To this end, a Statscan unit was installed at the Salt River Forensic Pathology Laboratory in Cape Town in late 2007. We reviewed the use of the Statscan at the Salt River Forensic Pathology Laboratory during the period January to June 2008, with reference to data collected from the death registry at the Division of Forensic Medicine and Toxicology at the University of Cape Town. The following variables were recorded from the death registry, for those cases that had undergone imaging: cause of death, method of death and whether an autopsy had been undertaken; Statscan image reports were reviewed to determine imaging findings. Using this information, we determined the extent to which the Statscan was being used as an adjunct to autopsy and the usefulness of the Statscan in determining the cause of death.

The Statscan was used in 172 autopsy cases examined during the study period. In 51% of cases, the Statscan was found to be useful in determining cause of death; it provided no useful information in 30% of cases and in 19% of cases, no notes were available for the Statscan images. Statscan was used most frequently in cases of homicide, sudden death and road traffic accidents, but also in cases of suicide, accidental death and burns.

PFOR10: Evidence belies a mother's account

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As is common in cases of non-accidental injury of children, this case showed major discrepancies between the history as provided by the mother (who was charged with the murder of the infant) and the injuries sustained.

This presentation aims to show how the knowledge of wounding patterns was used to disprove the possible scenarios as offered by the accused.