

## Hypoglycaemia in Clinical Medicine and Law 1922 - 2022

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## 1. Opinion Article

100 years – then 1922, now 2022, and Tomorrow

1. The world's first recorded Diabetes Hypoglycaemia low blood glucose event took place in Toronto in 1922 shortly after the first patient was treated with Insulin for T1D Type 1 Diabetes. Dr Jim Gilchrist was discovered to be behaving badly and was attended by a clinician and Toronto Police. After sleeping in a cell and given some food he recovered and was fine. Michael Bliss 1982 'The Discovery of Insulin'.
2. The first documented case in the UK of murder by insulin was that of Kenneth Barlow, a 38-year-old state registered nurse living in Bradford, England, whom it was alleged injected insulin into his wife's buttocks then found her in a bath on 4 May 1957. The forensic evidence taken from the blood sample from the buttocks discovered 84 units of insulin, adequate to keep an average sized diabetic patient alive for over 2 days. At trial it was suggested the dose discovered was enough to leave her unconscious leading to suspected irreversible brain damage. Found guilty of murder he maintained his innocence when convicted and high BG blood glucose was discovered in the heart. His wife with her permission had also received an injection of Ergometrine, a drug used in obstetrics at the conclusion of baby delivery and by lay persons when they could get hold of it to induce an illegal abortion. Kenneth Barlow was found guilty of murder on 13 December 1957. He was released in 1984. The forensics were questionable in 1957? Where are we in 2022 in such cases 100 years after the first patients were treated for Diabetes with Insulin?

How can a court be sure of a conviction when insulin is used in evidence? Insulin Murders, Vincent Marks and Caroline Richmond addresses 14 cases with forensic evidence issues associated to insulin. Other issues, eg electrolyte imbalance could trigger cause of death?

3. In the 1940's and thereafter several papers were published on the subject however in the late 1980's and early 1990's reports were disclosed of T1D Patients treated with insulin tragically passing away during the night, discovered often in bed, drenched in perspiration, in Diabetic Coma, with very low blood glucose. This was how Elizabeth Barlow found herself 3 May 1957 at 9.30pm, decided to take a bath, 9.45pm, Kenneth Barlow fell asleep after changing the sheets covered with vomit, then at 11.20pm Elizabeth was discovered submerged in water, he emptied the bath and tried artificial respiration which failed. The neighbour had a telephone and called the GP Doctor who found Elizabeth dead. He called the Police and a forensic post mortem was carried out 3.5 hours after Dr Price had first seen Elizabeth and 6 hours after she had died. Forensic awareness centred around being able to measure BG Blood Glucose level, C Peptide, Insulin assay. Such forensic issues were often referred to the University of Surrey where Dr Vincent Marks and Dr Derrick Teale conducted laboratory measurements to assist in identifying cause of death. After WW2 Vincent Marks became a world authority on Hypoglycaemia. The use of Insulin as a murder weapon was reviewed in 14 cases, Vincent Marks and Caroline Richmond, a laboratory scientist in pharmacology. In a summary of 14 cases since 1957 from England, Barlow, Bradford, was the first

documented case, then Germany, USA, Japan, New Zealand, Wales, were pathology described in 'Insulin Murders' True-Life Cases published 2007, RSM Royal Society of Medicine Press.

4. In the period mid 1987- 23.2.1994 when treated with NHS prescribed Insulin the author Derek Beatty regularly experienced going to bed at night and waking in the early hours of the morning with pyjamas soaking wet with perspiration which was horrible. A shower was often taken to freshen up combined with a cup of tea and biscuit or soft drink. Married to a nurse, the Harvey House GP Practice, St Albans, and at St Luke's Parish Church, Bricket Wood, failed to perform regular pathology clinical chemistry assay needs nor provide nor educate the use of finger prick blood glucose monitoring so as to establish a lifestyle pattern to enable a lifestyle with appropriate correct type and dose insulin to treat T1D Diabetes and diet, exercise recommendations to achieve normal adult values. Searle Diagnostic Clinical Pathology Service, Normal Values List, London 1974.
5. When the author arrived home from work starting a new job in London with walking exercise on 23 February 1994 at 6.30pm and sweating, despite it being cold February, his wife and daughter were present, he was presented with a letter requesting divorce. He became upset with diabetes Hypoglycaemia Coma and Neuroglycopenia. A neighbour was called to help. She dialled 999 and apparently was put through to the police. The event justified ambulance and police presence. No ambulance arrived. The police arrived. When informed the author was diabetic the two police constables recommended that the author get into his car and drive to get a Chinese carryout meal from a nearby restaurant. This was the worst advice the police could possibly have given to the author as not only could he have endangered his own life but also that of other road users. With difficulty the author was able to prepare a sandwich and soft drink however this was totally inadequate self-treatment for Hypoglycaemia and Neuroglycopenia. The on-call GP doctor from the GP Practice was called, he refused to attend to treat Hypoglycaemia and Neuroglycopenia. A phone call to a local ex family friend to help was refused, a call to a sister in law to get help was refused. The daughter aged 11 witnessed the event. She could have called an ambulance, failed to do so, and knew the author was treated for diabetes having on many occasions witnessed insulin injection by the author. The conditioned worsened leading to Neuroglycopenia seizure with convulsions described in detail with diagrams in 2007 in 'Insulin a Voice for Choice' 2007. Investigation disclosure in 1994, Vincent Marks, identified the association between Addison's Disease and Hypoglycaemia with Neuroglycopenia. On 23 February 1994 both the author with Diabetes and his wife with Addison's Disease experienced Hypoglycaemia with Neuroglycopenia and low blood glucose when both required Red Alert Emergency Paramedic attendance and transfer to hospital by Emergency Ambulance to diagnose errors in Endocrinology Treatment and Diagnosis with Chemical Pathology Tests and Endocrinology prescribed medication to treat the health disorders with ongoing regular diagnostic testing. The author was advised shortly afterwards in 1994 by Expert Witness Dr M Kiln that he was extremely lucky to have survived the near fatal event causing PTSD injury. The PTSD Injury caused by the event required cognitive therapy counselling which was successful despite flashbacks. The problem arises as this was a twofold Endocrine near fatal event when in truth neither patient victim was responsible and the cause in law was errors made by the Healthcare Providers of the Endocrinology, Diabetes and Addison's Disease patient care service provided to the patients, along with the failure to ensure correct education and knowledge be provided to NHS England registered prescribing doctors registered with the Charity the GMC, General Medical Council, and ensuring that Registered Nurses are made fully knowledgeable on how to handle and address a Red Alert Health Emergency Hypoglycaemia with Neuroglycopenia event.
6. In tragic neonate deaths in Maternity hospitals this issue of Hypoglycaemia is more complex to investigate and understand in Clinical Pathology and now in 2022 an added likely Genetic Inheritance parent or family Genetic Chromosome abnormality and possibly nerve environmental interference in Purkinje Cell stability in diet environment within the Endocrine system is likely to lead to helpful forensic disclosure to address diet needs to reduce obesity and mental health issues as noted in animal studies by the co-author.
7. The author has identified issues involving Munchausen Syndrome by Proxy in a blame culture linked to stigma involving Endocrinology especially in Diabetes, Addison's Disease and Thyroid Disease and the need in 2022 to address this Mental Health issue.
8. Concern was raised involving type of insulin prescribed to treat T1D Diabetes after BHI Human Insulin was granted approval 26 August 1982 by the Department of Health, MHRA Medicines and Health Regulator Association which allowed doctors registered with the GMC, General Medical Council, to prescribe insulin to treat diabetes subject to strict advisory prescribing guidelines which included dose reduction as it was known Human Insulin was faster acting than Beef Insulin and Porcine Insulin. A single molecule on the alanine chain identified the difference between the three insulins and for some unknown reason led to Human Insulin acting faster in reducing blood glucose. In failing to discuss this in detail with patients treated with insulin GMC registered doctors in the UK and especially GP's who were responsible in Primary

- Care to treat and protect the welfare of their patients in compliance with the Health and Safety at Work Act 1974, UK, brought about after the tragic Aberfan coal mining tip collapse in South Wales, 1966, led to failure in patient welfare and if tragedy occurred prescribing doctors could face criminality.
9. Following approval in the UK BHI Human Insulin was promptly granted licence approval in Germany 13 October 1982; the USA, FDA 28 October 1982; then BHI derived from human proinsulin 10 April 1982. In 1992 BHI was registered and approval to market had been granted in 65 countries.
  10. Endocrinology, Diabetes, Thyroid, Immunogenic interests linked to Hypoglycaemia and Neuroglycopenia was presented at the Banting Lecture 1994 by Prof Vincent Marks, University of Surrey, Hypoglycaemia – Real and Unreal, Lawful and Unlawful.
  11. Neuroglycopenia associated to Low Blood Glucose < 2.5-3.5 mmol/l identified links to Addison's Disease when Hypoglycaemia can also occur described as an Adrenalin or Addisonian Crisis caused by prescribed Hydrocortisone treatment dose of which may require to be adjusted at times of stress or menopause.
  12. Many patients prescribed insulin to treat diabetes and their families became so concerned about their welfare they turned to diabetes charities to share their patient experience and apparent lack of understanding of Hypoglycaemia by the medical profession and prescribing clinicians and GP's. An estimated salvo of 3,000 letters addressing Hypoglycaemia experience were sent to the BDA, British Diabetic Association for evaluation leading to a statistical summary of patient experience undertaken by the BDA which led to shared disclosure findings in Balance but in hindsight perhaps less forthright than required for patient needs. At the same time IDDT, Insulin Dependent Diabetes Trust was incorporated as a UK Charity to address the Hypoglycaemia issue and ensure patients were prescribed the correct Insulin best suited to treat their condition and avoid Hypoglycaemia Unawareness with importance to continue supply of Animal Insulins.
  13. Running in parallel 900 patients with diabetes and their families contacted solicitors in the UK to address the safety and marketing issues of the approved insulin. This led to Human Insulin Advice prepared by two leading barristers, Forrest and Evans, published 23 December 1992, at cost of £500,000, disclosed to the British Diabetic Association 26 January 1993 and the author in 1994.
  14. At the same time the IDDT, now the InDependent Diabetes Trust, worked tirelessly with dedicated due diligence to help patients with Diabetes experiencing problems get back their warning signs of impending hypoglycaemia and ensure they were prescribed the correct insulin and dose best suited to their needs. Global support followed when in October 2007 Prof Arthur Teuscher, Berne, published 'Insulin – A Voice for Choice'. This was launched IDDT Conference 13 October 2007. The author is the proud owner of one of the few signed copies by Arthur Teuscher who sadly passed away a few years ago but whose pioneering work and dedication along with Trustees of the IDDT, Jenny Hirst MBE, and Dr Matt Kiln, has been helpful in ensuring science understanding of Hypoglycaemia.
  15. Concerns were raised late 1980's early 1990's of unexplained death in bed of young patients treated with insulin for T1 D Diabetes; plus Loss of Warnings of impending Hypoglycaemia and Low Blood Glucose which if not promptly treated with fast acting glucose and carbohydrate can lead to Neuroglycopenia Coma and tragic complexity to understand and explain fatal patient event. Mental impairment with convulsions and seizure prior to coma can be experienced with irritable, aggressive mental health traits.
  16. Similarities occur in Addison's Disease and patients with Thyroid Health issues which may require fast acting Adrenalin to correct when a patient is in a state of Adrenalin or Addisonian Crisis with identical emergency Red Alert patient treatment needs.
  17. In 2019 Vincent Marks published 'Forensic Aspects of Hypoglycaemia' which compiled with presentation World Diabetes 2020, January 2020, Sydney, has provided some forensic answers to many hypoglycaemia questions asked at this time.
  18. Covid-19 struck in March 2020 and was identified as a serious immunogenic challenge to clinical researchers to identify the cause. Immunogenic reactions to IgE were identified associated with allergy to certain foods and dust mites addressed at the time by researchers at the University of Southampton around 2003. CO2 emission and pollution has now led to dramatic global warming today a universal tragedy.
  19. Respiratory effects had led to a fast rise in Asthma patient numbers and awareness in many countries where industry and CO2 emissions from vehicles were identified in built up towns and cities worldwide. The rapid rise in incidence of Pulmonary Hypertension and vascular issues for patients was researched in Germany then identified at Papworth Hospital, UK, when the benefit of prostacyclin inhaled therapy treatment to treat patients with severe pulmonary hypertension was successfully researched and published by clinicians associated with the newly formed Pulmonary Hypertension Association with centres in London, Sheffield, Newcastle, Glasgow, Belfast. This quickly followed in the USA after side reaction to slimming diets and use of slimming pills led to a dramatic increase in patients diagnosed with Hypertension throughout the USA. The development of a silent operated Multisonic® Infracontrol® nebuliser by Otto Schill GmbH Germany led to the successful use of the device to treat pa-

- tients in the community under the supervision and guidance of specialist clinicians and nursing staff.
20. In Germany the Infracontrol™ nebuliser potential in critical care was identified as a likely use to deliver inhaled therapy, possibly antibiotic treatment for Covid-19 and explored with Costa Rica where a similar set up had been successfully used to treat Covid-19 patients pre Covid-19 vaccination programme.
  21. The opportunity was presented at a global after Generation Scotland Covid Life Survey May 2020 then Clinical webcam and published 'Forensic Aspects of Hypoglycaemia', August 2020. Around this time the technology concept to treat patients with Covid-19 using the Infracontrol® Nebuliser received an award from a Health Publishing Organisation, Birmingham, at the same time as EY Ernst Young, Accountants, received a similar award for their firm's work in healthcare. An interesting coincidence!
  22. Today in 2022 we have moved forward in Hypoglycaemia Research, but much research remains. Clinical Medicine Kumar Clark's 7th Edition, updated and edited by Dr Nicola Zammit and Dr Ewan Sandilands, Edinburgh, is a most helpful update to address Red Alert Hypoglycaemia events both in the Community and in a hospital environment. The amazing publication of the Genome Odyssey, Euan Ashley, 2021, and the cardiac journey of Lailani Roberts with description of genetic issues addressing possible chromosome defects in patients and babies inherited from birth are identified. This significant forensic fact in a complex clinical area of medical research where in the past we were left with little understanding of the cause of fatality, today this 100-year history provides a more stable forensic foundation on which to base structured factual observations to assist in clinical diagnosis of complex health issues which have arisen from Covid-19 pandemic and can relate to diet and environmental circumstances at a cellular level.
  23. The findings at this stage are shared to assist in understanding reasoning to help clinicians and nurses better understand clinical needs of babies and patients at risk of rare disease to enable hospital management to be better prepared to provide education and knowledge during educational learning and thereafter. The forensic objective is to assist investigators address from a patient and carer perspective to learn from experience gained and be able within social media and other promotional ways to benefit interested persons and especially the Police, Social Services and the Courts to be able to weigh up the weight of evidence to prevent re occurrence and possible fatality and on investigation identify whether errors have been made in recent years or in the distant past to enable victims of abuse or cover up understand why errors may have occurred and prevent future mistakes and even miscarriage of justice by obstructed justice either deliberate in error cover up or accidental when hospital management may not have been up to speed in knowledge and implementation to protect lives to provide correct duty of care to patients when under their healthcare provider.
  24. 14 November 2022 was World Diabetes Day 2022. Amazing new disclosures in Diabetes and Endocrinology Thyroid Research have been gathered and published opening the door to improved diagnosis and patient care. Immunogenic research with opportunities in improved Diabetes and Thyroid Care, Neurological benefit in Mental Health, Parkinson's Disease, Dementia, Alzheimer's Disease, often with simple lifestyle change, exercise, relaxation, leading to positive mental health and the opportunity for a good tomorrow.
  25. The role of Purkinje Cell environmental health and diet support in Neurology will lead to better understanding of Hypoglycaemia associated with Mental Health and eating habits to benefit welfare and minimise hypoglycaemia risk. New research undertaken at Monash University, Malaysia, to be presented IDF International Diabetes Federation International Meeting, Lisbon, December 2022, will show out comes demonstrated Neuroprotection of the Purkinje and Pyramidal cells at the cerebral cortex and hippocampus when treated with environmental enhancement (EE). All current evidenced based reports identify this as very promising to gain better understanding of the Hypoglycaemia associated with Mental Health and identify eating habits to benefit welfare and minimise hypoglycaemia risk, especially in Neonates and Paediatrics when tragic fatality is often left as a family mystery.
  26. Alpha Life Screen, with targeted 20,000 screens in UK, University of Birmingham, to screen T1D Diabetes patients to identify likelihood risk factor that baby could inherit T1D from parents if one or both or family member have T1 Diabetes has been launched in the UK.
  27. In Germany 160,000 T1D patients have been screened. In the USA screening is for T1 Diabetes and Celiac disease known to be associated with Diabetes.
  28. In Sweden the screening programme includes Thyroid and Hypothyroid disease.
  29. This screening Diabetes programme is now being started in UK with volunteers.
  30. Reference details of this research at this stage are available on request from the authors.
- Thank you for allowing us to share this joint research as an abstract in late 2022. More detailed publication of this work and further research study is planned over the next 3 years leading to University Hypoglycaemia Course design for study to achieve qualification in Hypoglycaemia associated with Clinical Medicine and Law as a

speciality in Clinical Research.

Our summary details in this abstract into the matter of Hypoglycaemia and Neuroglycopenia are offered in identification of its threat to health wellbeing today and into the future as many patients diagnosed with Long Covid are left struggling in society within a difficult stigma experience.