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TMJ Blog

The Lucy Letby case and the implications of a new international report

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Abstract
I summarise and comment on a new international report on the Lucy Letby case of murder or attempted murder of 14 neonates in the UK in which the defendant was found guilty on all counts and sentenced to life imprisonment. The report concludes that no crime took place and therefore that Letby is innocent. The case has been referred to the Criminal Cases Review Commission. *Tasman Medical Journal, 20 March 2025.*

This is not a paediatric Journal but we have an interest in all areas of medical practice and its social consequences. The committal of a member of another caring profession (a nurse) for life in prison without release, after being found guilty of murder and attempted murder, raises many questions but most of all depends on incontrovertible evidence pointing to guilt with absence of reasonable doubt. However, an international expert panel's recently-published Report on the case of Lucy Letby[1] may be taken to indicate reasonable doubt in that case.

Lucy Letby was convicted in England of the murder or attempted murder of 14 neonates, in two trials in the UK that ended in 2023.[2] The deaths occurred between June 2015 and June 2016 in Letby's workplace at the Countess of Chester Hospital (CoCH) Neonatal Unit, Cheshire, England. Letby was given 15 whole-of-life prison sentences. The murders were allegedly committed mainly by injecting air or insulin into the veins (in one case air into the stomach via a nasogastric tube) of the neonates. We do not suggest that the Court, on the evidence provided, did not meet the usual standard of guilt. Two appeals against the convictions have been denied.

An international panel of fourteen neonatologists and paediatricians (one of whom prefers to remain anonymous) has now reviewed the clinical evidence in the Letby case as a summary Report[1] and presented its overall conclusions at a press conference on 4 February 2025.[3] The full report has been submitted in a brief to the Criminal Cases Review Commission. In startling contrast to the Jury's findings, the panel concluded that all the deaths were natural and that no crime was committed. Rather, it concluded that the deaths were caused at least in part by poor medical management, obsolete buildings, understaffing, and inadequately qualified or trained staff (Table 1).

The standing of an expert Report depends on the standing and qualifications of its authors as well as the quality of the adduced evidence. The thirteen authors are named in the Report, and their standing is not in doubt. The panel was set up on the suggestion of Emeritus Professor Shoo Lee, whose 1989 paper[4] was introduced as evidence for the prosecution (he was not a witness at the trial). He has claimed that the 1989 paper was inaccurately presented. An updated Report by Lee was published[5] in 2024 (after the trial and two applications

Table 1: The expert panel's conclusions as to causes of death and comments for 7 cases allegedly due to murder (n = 4) or attempted murder (n = 3). Baby numbers are as used in the Summary Report.

Baby	Panel's opinion on cause or causes	Outcome	Comment
1	Thrombosis.	Death	Mother had antiphospholipid syndrome.
4	Systemic sepsis, pneumonia, disseminated intravascular coagulation. Delay in recognizing respiratory distress, starting antibiotics, and poor treatment.	Death	Mother should have received intrapartum antibiotics.
6	Prolonged hypoglycemia due to sepsis, prematurity, borderline intrauterine growth restriction, lack of intravenous glucose. Poor medical management of hypoglycemia.	Survived	Emergency Caesarian section at 29 weeks. The neonatal insulin level was within the norm for preterm infants.
7	Vomiting and clinical deterioration due to infection, possibly Enterovirus.	Discharged	Preterm infant born at 23 weeks.
9	Respiratory complications caused by respiratory distress syndrome and chronic lung.disease, complicated by *S maltophilia* colonization from known sewage contamination of the hospital. Doctors failed to respond to warnings about *S. maltophilia*, did not recognize the diagnosis, and did not treat with the appropriate antibiotics.	Death	Born at 27 weeks. The apnoea alarm being turned off was given as a reason for delay in intervention but the panel found no evidence of that.
11	Inadequate intubation (ET tube too small) and artificial respiration.	Inter-hospital transfer	Born at 25 weeks.
15	Pre-existing subcapsular liver haematoma caused by traumatic delivery, resulting in haemorrhage into the peritoneal cavity and profound shock.	Death	Triplet birth at 33 weeks. Pre-existing pathology existed but not recognised.

for appeal, both of which were rejected) to take account of papers published since 1989 and the consequential changes in knowledge regarding air embolism in neonates. Lee's more recent paper is annexed to the Report.

The method used by the panel was for each case to be studied independently by two members, who were provided with case records and witness statements used in the trial. If the two agreed, their finding was noted and accepted. In the event of disagreement a third panel member was asked to review the case independently and *"...a consensus opinion was developed."*[1] This method means that though the Report has fourteen authors, conclusions in each case derives from study by a maximum of three experts. The number of cases studied by three individuals is not stated. The Report does not describe what action was taken in the absence of a three-way consensus, whether that situation in fact arose, or whether the panel as a whole read and agreed with all of the summaries. Perhaps these details will become clear when the full report is published.

The panel's overall conclusions were that (a) there was no medical evidence to support malfeasance causing death or injury in any of the 17 cases in the trial; (b) the death or injury of affected infants were due to natural causes or errors in medical care; (c) there were background problems related to the medical care of patients at the CoCH neonatal unit, teamwork and inter-disciplinary collaboration. These findings amount to a considered and learned declaration of Letby's innocence on all charges. Table 1 displays the Panel's conclusions for the seven allegedly murdered infants.

More detailed contributing factors were also presented, in addition to concerns voiced by staff. The source or sources of these factors (below) were not stated:

1. Medical histories were incomplete
2. Failure to consider the obstetric history
3. Disregard for surveillance warnings about infectious bacterial colonization
4. Misdiagnosis of diseases
5. Caring for patients that were beyond their designated level of care
6. Unsafe delays in diagnosis and treatment of acutely ill patients
7. Poor skills at resuscitation and intubation
8. Poor supervision of junior doctors in procedures like intubation
9. Poor skills in basic medical procedures like insertion of chest tubes
10. Lack of understanding about respiratory physiology and basics of mechanical ventilation
11. Poor management of common neonatal conditions like hypoglycemia
12. Lack of knowledge about commonly used equipment in the NICU, e.g. Neopuff, capnograph

13. Failure to protect at risk patients (e.g. haemophilia) from trauma during intubation
14. Lack of teamwork and trust between the health professions

The concerns voiced by staff were: Inadequate numbers of appropriately trained personnel and of staffing in general, and resulting work overload; lack of training for assigned nursing roles; poor hospital plumbing and drainage, resulting in need for intensive cleaning, a potential factor in *S. maltophilia* colonization and infection; poor environmental temperature control; difficulty in finding a doctor when required; congestion at medication cabinet and preparation trolley; lack of appropriate facilities for sterile preparation, for example IV drugs prepared in corridor; some high risk infants should not have been born or cared for at CoCH but at higher level institutions; and delays in transfer of sick infants to higher level facilities.

Several statements in the Report require clarification:

• The case summaries for babies 1 and 4 state *"When air is injected into the veins, air bubbles must first traverse the lungs where they are filtered out by a vast bed of small blood vessels. In infants, there is a hole in the heart (foramen ovale) that normally closes shortly after birth, so it is possible for air bubbles to escape through the hole into the arterial system."* The introductory phrase is odd, given that the panel's conclusion that no air was deliberately injected, but the statement is potentially misleading, as it implies that most air reaching the lung (without any stated limit) is scrubbed. Small quantities of air may be either absorbed across the vascular basement membrane or pass through the pulmonary microcirculation; strictly speaking removal by these means is not "filtration". However, if the foramen ovale or ductus arteriosus are patent, air can transfer directly from right to left sides of the hearts *before* the blood reaches the lungs. Closure of both ducts may be delayed, especially in premature neonates, thereby increasing the probability of transfer to the arterial circulation in the judicial population. Lee's more guarded wording[5] is *"Venous air embolism is potentially less harmful than arterial air embolism because air bubbles are filtered out in the microvasculature of the lung and do not enter the arterial vasculature to cause organ failure. In infants, however, the small lung sizes can be overwhelmed by as little as 3 to 5 ml of air, and air can enter the arterial vasculature through the patent ductus arteriosus. In this cohort* [in Lee's paper: Ed]*, the mortality rate was 85.3% among infants with arterial air embolism (lung injury/assisted respiratory support) and 70% among infants with venous air embolism (accidental IV air injection), while the incidence of neurological sequelae among survivors was 41.6 and 0%, respectively."* Note the very high mortality reported by Lee and the modestly lesser mortality relating to air in the veins.

• The question of skin discolouration and its indication of venous air embolisation is raised. The Report quotes Lee's paper as containing the statement (or words to the effect) that *"... patchy skin discoloration has never been reported in infants with venous air embolism, including IV air injection."* Lee's paper contains no such comment. Rather, he discusses skin discoloration generally in his paper, as follows: *"Cyanosis, pallor, and mottling were commonly associated with non-specific generalized skin discolorations and reflected hypoperfusion and oxygen deprivation resulting from circulatory collapse. Non-specific localized transient skin discolorations, including blanching, blue-black, red, or vivid patches, and migrating areas of pallor in the extremities, were Reported in six infants (7.3%) with lung injury/assisted respiratory support and one infant (5%) with surgery, but not among infants with accidental IV air injection or other causes. Non-specific skin discolorations are likely the result of vasospasm and vasodilation of cutaneous blood vessels as they redistribute blood in response to cutaneous hypoperfusion and hypoxia during circulatory collapse. Air bubbles can also cause transient skin discoloration through blood vessel occlusion or spasm induced by irritation of the gas. Petechiae were noted in one infant but they appeared before the onset of vascular air embolism and are likely due to other causes. There are few pathognomonic cutaneous signs of vascular air embolism in infants. Lee's sign (pink red blood vessels superimposed on the cyanosed background) is a specific skin discoloration that has only been Reported in infants with vascular air embolism and is attributed to direct oxygenation of erythrocytes adjacent to free air in the vascular system, while the tissues continue to be poorly perfused and oxygenated."* Thus Lee recognised that several skin colour changes may occur in such cases but are not primarily caused by the air, and describes only one skin change that has *"...been reported in infants with vascular air embolism."* Whether or not this skin appearance is in fact a pathognomonic change, as implied by Lee in saying *"There are few pathognomonic cutaneous signs..."* remains uncertain. Overall, it appears that skin discolouration in advanced severe neonatal disease can be caused by such a multiplicity of factors in a neonatal ICU that neither its presence or absence has reliable evidentiary quality in relation to air embolism.

The literature contains several relevant case reports reflecting the behaviour and consequences of venous air embolism in neonates or infants. As stated in both the Lee papers,[4,5] the majority of cases (around 80%) arise from cardiopulmonary resuscitation and positive pressure ventilation,[6-9] including (as in baby 11 described in the Report) cases where the wrong size of endotracheal tube

may have been inserted. Only a small volume of air, around 0.5 ml, needs to be transferred in a neonate to cause severe deterioration or death. Other actual or potential causes include surgery;[10] insertion or use of nasogastric tubes; production of gas (which is not identical with air) by *C. perfringens*; inadvertently during radiological procedures;[11] or during changes of syringes, used to administer drugs, subject to inadequate flushing of air. The cumulative volume of air so injected may reach values known to have substantial clinical effects.[12] In other words, several mechanisms arising out of natural diseases or common intensive care procedures, or clumsy or inexpert but unintended application of these procedures, can cause inadvertent clinical deterioration or death. One must conclude that in a neonatal ICU setting in which air in the systemic circulation is demonstrated or suspected, several causes other than homicide are possible, and homicide as a cause must rely on other evidence.

This new Report needs to be seen in the context of previous out-of-court challenges to clinical and statistical evidence submitted to the Court, as published by authoritative mainstream news media including the BBC, the Guardian, and the Conversation. One such was a chart prepared by police purporting to be evidence of guilt by association between Letby's presence in the ward on all the dates of death of the 7 allegedly murdered children or attempted murder of others, with no corresponding finding for any other nurse. The chart appears convincing but is said by statisticians to be fallacious. The fallacies in the argument need to be presented in detail, but it is clear that the rules for entry of both victims and staff names in a chart of this sort must be unbiased – and in the Letby case, some deaths were not included. It is also clear that if no crime has been committed the chart is irrelevant since it is nothing more than a record of attendance according to a roster.

Conclusion

An international panel Report relating to the Letby case, which is a summary of a confidential full report submitted to the CCRC has been published.[1] The credentials of the individual panelists are not in doubt and their conclusions supporting innocence of Lucy Letby in the reported 7 cases demand due respect. The claim that the conclusions apply to all the cases remains to be seen and studied. The Report is open to criticisms that would have been obvious to these same academics: the scrutiny of each case by a small number of panelists (giving rise to a risk of either false positive and false negative conclusions), misquotations of the annexed paper, and lack of detailed description of the pathophysiology and diagnosis of air embolism and the source of the emboli in neonates admitted to a neonatal ICU. In our view, none of these imperfections, which may not be present in the full report, are of sufficient weight on their own to justify a negative response by the CCRC. The conclusions of the panel surely raise reasonable doubts over Letby's guilt, which if accepted indicate that further proceedings in this case are justified.

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Note added 20 March 2025

This blog was originally published on 5 March 2025. Subsequently, my attention was drawn to a long and thorough examination of the Letby case by Rachel Aviv published in the New Yorker magazine in May 2024, now added here as reference 13. Using non-emotive language and adhering to the best of journalistic standards, Aviv's article raised the possibility of Letby's innocence in convincing terms. It

contains details of trial witness statements on giving evidence and other comments by parties to the prosecution comments. It also provides a more detailed explanation of the statistical errors implicit in the police list allegedly showing Letby's unique presence on duty on the days when the alleged crimes occurred. Some details may be subject to restriction orders imposed by the Court, which explains in part why the article was published in the USA. Accordingly, it may be unlawful to publish the article in the UK. Whether the Court orders apply to a work downloaded from the internet needs to be considered by UK residents.