IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

COR 2019 6834

FINDING INTO DEATH WITHOUT INQUEST

Form 38 Rule 63(2)

Section 67 of the ***Coroners Act 2008***

Findings of:	Coroner Katherine Lorenz
Deceased:	RMI[1]
Date of birth:	6 December 2019
Date of death:	14 December 2019
Cause of death:	1(a) Perinatal hypoxia
Place of death:	The Royal Children's Hospital Melbourne, 48 Flemington Road, Parkville, Victoria, 3052

[1] A pseudonym.

INTRODUCTION

1. On 14 December 2019, RMI was 8 days old when he died of perinatal hypoxia at the Royal Children's Hospital Melbourne (**RCHM**).

2. RMI's mother, BLI[2] gave birth to him by emergency caesarean section at approximately 7:30pm on 6 December 2019, at Albury Wodonga Health (**AWH**).

THE CORONIAL INVESTIGATION

3. RMI's death was reported to the Coroner as it fell within the definition of a reportable death in the *Coroners Act 2008* (**the Act**). Reportable deaths include deaths that are unexpected, unnatural or violent or result from accident or injury.

4. The role of a coroner is to independently investigate reportable deaths to establish, if possible, identity, medical cause of death, and surrounding circumstances. Surrounding circumstances are limited to events which are sufficiently proximate and causally related to the death. The purpose of a coronial investigation is to establish the facts, not to cast blame or determine criminal or civil liability.

5. Under the Act, coroners also have the important functions of helping to prevent deaths and promoting public health and safety and the administration of justice through the making of comments or recommendations in appropriate cases about any matter connected to the death under investigation.

6. Victoria Police assigned Senior Constable Patrick Guin (**SC Guin**) to be the Coroner's Investigator for the investigation of RMI's death. SC Guin conducted inquiries on my behalf.

7. This finding draws on the totality of the coronial investigation into RMI's death, including evidence contained in the coronial brief. Whilst I have reviewed all the material, I will only refer to that which is directly relevant to my findings or necessary for narrative clarity. In the coronial jurisdiction, facts must be established on the balance of probabilities.[3]

[2] A pseudonym.

[3] Subject to the principles enunciated in *Briginshaw v Briginshaw* (1938) 60 CLR 336. The effect of this and similar authorities is that coroners should not make adverse findings against, or comments about, individuals unless the evidence provides a comfortable level of satisfaction as to those matters taking into account the consequences of such findings or comments.

MATTERS IN RELATION TO WHICH A FINDING MUST, IF POSSIBLE, BE MADE

Circumstances in which the death occurred

8. RMI was born by emergency caesarean section at AWH on 6 December 2019 at approximately 7:30pm. He was born at 40 weeks and 1 day gestation. BLI's expected due date was 5 December 2019.

9. RMI was the first child born to BLI and her ex-partner NVT[4]. At the time of RMI's birth, BLI was 23 years old.

10. The pregnancy was without complications and serology screening for infections[5] that could impact RMI were negative. BLI's blood group was O positive and her oral glucose tolerance test was normal.

11. At the 20-week ultrasound on 18 July 2019, there were no indications of abnormalities. RMI was noted to be within normal growth range and regular movements were observed.

12. BLI presented at AWH multiple times during her third trimester due to concerns relating to RMI's reduced movements.

13. Ultrasounds were conducted on 2 October and 4 October 2019. No abnormalities were reported. The amniotic fluid volume was within the normal range, as was the foetal umbilical artery blood flow, middle cerebral artery blood flow and foetal movements.

14. CardioTocoGraphic (**CTG**) electronic monitoring of RMI's heartbeat was performed on 1 October, 2 October, 3 October, and 4 October 2019. The results showed a normal baseline for foetal heart rate.

15. On 30 November 2019, BLI presented again to AWH with reduced foetal movements. A CTG was unremarkable and showed normal baselines, variability and accelerations in heart rate.

16. On 1 December 2019, an ultrasound showed an amniotic fluid index reading of 29. This is a particularly high reading at 39 weeks gestation. Other ultrasound readings were within the normal range. The foetal umbilical artery blood flow and middle cerebral artery blood flow readings were normal, and an induction of labour was booked to occur on 13 December 2019.

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[4] A pseudonym.

[5] Blood tests may include testing for Varicella, Syphilis, Human Immunodeficiency Virus (HIV) infections and Hepatitis B and C serology.

17. On 6 December 2019, BLI presented to AWH with reduced foetal movements at approximately 1:00pm. A CTG was commenced at approximately 2:00pm and returned abnormal readings. There was significantly reduced variability in RMI's heart rate, no accelerations in response to foetal movements, and his baseline was above the normal range at 150 beats per minute.

18. At approximately 4:00pm, an ultrasound was performed and noted that both the umbilical artery blood flow and middle cerebral artery blood flow were abnormal.

19. At approximately 6:00pm, a CTG showed that there was no variability in RMI's heart rate and his baseline was rising to 160 beats per minute. The last CTG at approximately 6:45pm recorded no variability and a heart rate of 165 beats per minute.

20. At approximately 7:20pm, BLI was administered an epidural top up of intrathecal morphine, and an emergency caesarean section followed.

21. RMI was born at 7:34pm with a birth weight of 3948 grams. There was a documented true knot in the umbilical cord and the cord was wrapped around his body.

22. RMI was noted to be "stunned at delivery" and pink in colour. He had spontaneous respirations, a heart rate of 100 beats per minute and was floppy in tone.

23. Soon after his birth, a period of apnoea required five Intermittent Positive Pressure Ventilations in air using a face mask. RMI was spontaneously breathing, but with increased respiratory effort and respiratory rate.

24. At 7:44pm, RMI was transferred to the Special Care Nursery at AWH. A consultant paediatrician was called to attend at 8:25pm, arriving at 8:30pm. At this time, RMI was being supported by Continuous Positive Pressure Airway Pressure (**CPAP**).

25. RMI's eyes were open initially, but there was no response to painful stimuli and he was described as extremely hypotonic. Early and ongoing abnormal bilateral limb, lip and tongue movements were observed and suggestive of seizures.

26. Approximately 1.5 hours after his birth, RMI's arterial gas was abnormal, showing a high lactate reading.

27. The Paediatric Infant Perinatal Emergency Retrieval service was contacted and arrived at AWH at midnight. RMI was transferred to the RCHM Newborn Intensive Care Unit and arrived at 03:20am on 7 December 2019.

28. Following arrival at RCHM, RMI remained on CPAP for respiratory distress. He was reported to have significant hypotonia with no reactivity to stimulation and ongoing seizure activity. BLI was flown to Melbourne the following day.

29. In the morning of 7 December 2019, RMI was intubated for airway management due to ongoing seizures. He received phenobarbitone, midazolam and Keppra for seizure control.

30. The Metabolic Team at RCHM were consulted early to consider possible metabolic disorder given RMI's high lactate readings. A urea cycle defect or fatty acid oxidation defect was considered unlikely given RMI's normal ammonia levels.

31. On 8 December 2019, Consultant Intensivist Dr Trisha Prentice (**Dr Prentice**) met with BLI and her mother to explain the severity of RMI's encephalopathy. BLI expressed concern regarding poor perinatal management and the knot in RMI's umbilical cord. Dr Prentice noted that if RMI's condition was due to an acute asphyxia event at the time of delivery, a greater degree of metabolic acidosis would have been anticipated to correlate to his clinical presentation.

32. Dr Prentice discussed other differential diagnoses including metabolic issues. RMI was reviewed by the Victorian Clinical Genetics Service and BLI agreed with a plan for DNA store if there were further evolving features of a monogenetic cause. Dr Prentice explained that, although this would not change the treatment plan or RMI's chance of survival, it could assist them to understand the nature of the illness and assist with planning for future pregnancies.

33. Neuroimaging was completed on 7 December and 10 December 2019, showing an extensive brain injury. The brain changes were consistent with Hypoxic Ischaemic Encephalopathy but there were some atypical features noted on MRIs which raised suspicion of a metabolic disorder. The timing of the brain injury was reported to likely have occurred somewhere between 3-5 days earlier.

34. The metabolic team were again consulted, and multiple metabolic investigations were performed. All metabolic and muscle testing results subsequently returned were normal.

35. Several discussions occurred between the medical team at RCHM and RMI's parents. These discussions culminated in the decision to redirect RMI's care and withdraw life support.

36. RMI was extubated on 13 December 2019 at 3:42pm. BLI remained in the hospital holding RMI until he died on 14 December 2019 at 3:30am.

Identity of the deceased

37. On 14 December 2019, RMI, born 6 December 2019 was visually identified by his mother, BLI, who signed a statement of identification form.

38. Identity was not in issue and did not require further investigation.

Medical cause of death

39. Perinatal pathologist Dr Fiona Chan (**Dr Chan**) under the auspices of the Victorian Perinatal Autopsy Service conducted an autopsy on 18 December 2019 and provided a written report of her findings to the Victorian Institute of Forensic Medicine (**VIFM**).

40. Subsequently, Dr Linda Elizabeth Iles (**Dr Iles**) of VIFM considered relevant materials and the autopsy report of Dr Chan to produce a written report of her findings dated 8 September 2020.

41. Post-mortem examination revealed severe global cerebral injury, characterised by fibrous proliferation of glial cells in the cerebellum, brainstem, corticospinal tract and cortical white matter. There was evidence of antenantal hypoxia in the setting of no underlying structural abnormalities.

42. Dr Iles noted that the unavailability of the placenta for pathology significantly limited her capacity to holistically interpret the autopsy findings.

43. Dr Iles provided an opinion that the medical cause of death was 1(a) Perinatal hypoxia.

44. I accept Dr Iles' opinion.

FAMILY CONCERNS

45. In correspondence received by the Court on 20 January 2020 and 13 October 2020, BLI outlined concerns relating to her medical management during her pregnancy and RMI's subsequent birth. I acknowledge all of BLI's concerns but specifically highlight the following:

a) BLI states that on multiple occasions throughout her pregnancy, she instructed her obstetricians and doctors to make enquiries as to the positioning and blood flow of the umbilical cord. She states that she was assured repeatedly that there were no concerns.

b) BLI states that she attended AWH multiple times during her third trimester due to concerns that RMI had been inactive and was advised that everything was normal.

c) BLI states on 3 December 2019, her midwife recommended an immediate appointment with Dr Thomas for membrane stripping to induce labour. BLI states that Dr Thomas determined not to undertake the procedure and advised her that RMI was well.

CORONER'S PREVENTION UNIT

46. During the coronial investigation, and in view of the family concerns raised, I referred this matter to the Health and Medical Investigations team of the Coroner's Prevention Unit (**CPU**)[6]. CPU reviewed the available material and provided me with advice.

47. The CPU advised that reduced foetal movements are associated with adverse pregnancy outcomes, and that the Australian New Zealand Stillbirth Alliance (**ANZSA**) have developed associated guidelines which have been adopted by Victoria's Better Safer Care. The guidelines suggest that a woman presenting with a history of reduced foetal movements should have a CTG performed within two hours. An urgent ultrasound should be arranged if the presence of foetal heart rate is not confirmed. If the CTG is normal but foetal movements do not return to normal, the woman's care should be escalated to a senior clinician. If the CTG is normal and foetal movements are observed, clinicians should advise the woman to return if reduced foetal movements recur and provide her with written information about expected foetal movements.

48. The CPU advised that the AWH medical records did not contain medical review progress notes nor discharge summaries relating to the occasions on which BLI presented to hospital with reduced foetal movements. The CPU noted that AWH clinicians did not appear to appreciate the significance of past presentations for reduced foetal movements and the increased risk this posed to BLI's pregnancy.

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[6] The Coroners Prevention Unit (CPU) was established in 2008 to strengthen the prevention role of the coroner. The unit assists the Coroner with research in matters related to public health and safety and in relation to the formulation of prevention recommendations. The CPU also reviews medical care and treatment in cases referred by the coroner. The CPU is comprised of health professionals with training in a range of areas including medicine, nursing, public health and mental health.

49. I afforded AWH an opportunity to respond to CPU's advice as set out above. Julia Wright, Director of Midwifery & Nursing – Women's and Children's Services and Acting Executive Director of Nursing and Midwifery, provided a statement dated 31 August 2022 addressing the matters.

50. In her statement, Ms Wright stated that the hospital respects and recognises the importance of adequate medical documentation to facilitate information-sharing.

51. Ms Wright commented that each of BLI's attendances on 2 August, 20 August, 1 October, 2 October, 3 October, 4 October and 30 November 2019, a record was made of her report of decreased foetal movements. And on each occasion, the FHR was auscultated, a CTG performed, or an ultrasound performed, all with reassuring results.

52. AWH submitted that the medical records contained details of each of BLI's presentations and the detection of a foetal heart rate on each occasion and that its practitioners at subsequent attendances had available to them the details of the past presentations for investigation of reduced foetal movements and the reassuring investigation results.

53. It was accepted that such details were not all recorded in medical review progress notes nor discharge summaries, but Ms Wright stated that the information was captured in other places such as antenatal outpatient attendance notes, pregnancy health record notes, maternity unit assessment forms and some progress notes throughout the clinical file.

54. Ms Wright reported that AWH has since strengthened and updated its practice of information sharing to include adding printouts from the hospital notes from the Birthing Outcomes System for all women attending the hospital during pregnancy for appointments to the Maternity Outpatient Clinic. This includes ensuring ultrasound results, notes and management plans are attached to the woman's hand-held Pregnancy Health Record - a patient record carried by the woman throughout the pregnancy that the women can provide to each pregnancy care practitioner she attends.

55. Ms Wright reported that AWH has also since moved to ensure indications for placental histopathology (in line with Safer Care Victoria recommendations) are clearly visible in the Birth Suite with laminated copies provided in appropriate places and that staff continue to be reminded and educated regarding the importance and indications for histopathology. Ms Wright also noted that the procedures and guidelines for vaginal birth and caesarean section also include information regarding indications for placental histopathology.

COMMENTS

56. I make the following comments pursuant to section 67(3) of the Act.

    a) In line with the advice provided to me by the CPU, I note that AWH should ensure the accuracy of all medical documentation, including the accurate recording of the timing of events, to improve communication and information-sharing between members of a woman's treating obstetric team.

    b) I also note the pivotal importance of placental pathology in the instance of perinatal deaths and emphasise the need for hospitals to preserve and provide placental pathology for forensic examination.

FINDINGS AND CONCLUSION

57. Pursuant to section 67(1) of the Act, I make the following findings:

    a) the identity of the deceased was RMI, born 6 December 2019;

    b) the death occurred on 14 December 2019 at The Royal Children's Hospital Melbourne, 48 Flemington Road, Parkville, Victoria, 3052, from perinatal hypoxia; and

    c) the death occurred in the circumstances described above.

58. I convey my sincere condolences to RMI's family for their loss and acknowledge the profound grief and sadness brought to them following his unexpected passing.

59. I direct that this Finding be published on the Coroners Court of Victoria website in accordance with section 73(1A) of the Act.

60. I direct that a copy of this finding be provided to the following:

    BLI and NVT, Senior Next of Kin

    Annabelle Mann, Royal Children's Hospital Melbourne

    Dr Ken Cheng, Albury Wodonga Health

    Safer Care Victoria Maternity and Newborn Clinical Network

    Consultative Council on Obstetric and Paediatric Mortality and Morbidity

    Senior Constable Patrick Guin, Coroner's Investigator

Signature:

Katherine Lorenz

Coroner Katherine Lorenz

Date : 30 September 2022

NOTE: Under section 83 of the ***Coroners Act 2008*** ('the Act'), a person with sufficient interest in an investigation may appeal to the Trial Division of the Supreme Court against the findings of a coroner in respect of a death after an investigation. An appeal must be made within 6 months after the day on which the determination is made, unless the Supreme Court grants leave to appeal out of time under section 86 of the Act.