

"With respect to this proposition I make the following comments. Hyponatraemia is impossible to diagnose at autopsy as the sodium levels in the vitreous humour tend to fall as a normal post mortem phenomenon and thus the identification of the "low" vitreous sodium is not evidence of ante mortem hyponatraemia. Notwithstanding the foregoing caveat, should there be objective evidence of excessive water intake in Ms Killen, the autopsy findings would be consistent with death being due to a cardiac arrhythmia in the setting of electrolyte derangement. Post mortem CT revealed cerebral oedema."

15. Dr Jane Canestra of the Victorian Department of Health assisted the coroner in her investigation and provided information as to clinical features of hyponatraemia and its presentation in cases of extreme or arduous activity or sports.

16. Research is currently being undertaken in relation to hyponatraemia on the Kokoda Track by researchers at the James Cook University. A member of this research team, Dr Sean Rothwell an emergency physician, also provided a report at the coroner's request. Dr Rothwell reported:

"Exercise-associated hyponatraemia (EAH) is defined as a plasma serum sodium concentration of less than 135 mmol/L, occurring either during or up to 24 hours after prolonged physical activity.

The primary cause of EAH is excess consumption of fluids. Other factors contributing to EAH include:

- a. Inappropriate secretion of antidiuretic hormone during exercise;*
- b. Sodium loss from sweating may play a minor role.*

Recognised risk factors for developing EAH include:

- a. Excessive drinking behaviour;*
- b. Weight gain during exercise;*
- c. Female sex;*
- d. Low body weight;*
- e. Slow running or performance pace;*
- f. Event inexperience;*
- g. Non-steroidal anti inflammatory agents;*
- h. >4 hours exercise duration;*
- i. Unusually hot environmental conditions;*
- j. Extreme cold temperatures.*

Signs and symptoms of EAH include:

- a. Early, non-specific symptoms such as bloating, puffiness, headache, nausea and vomiting;*
- b. As the severity of EAH progresses, more serious signs and symptoms develop as a result of;*
 - a. Cerebral oedema - ataxia, agitation, confusion, delirium, obtundation, seizures, coma and death;*
 - b. Pulmonary oedema - respiratory distress.*