

10. Samantha's body was repatriated to Australia and an autopsy was conducted by Dr Matthew Lynch, Senior Forensic Pathologist of the Victorian Institute of Forensic Medicine. Dr Lynch reported that the cause of death was unascertained.

*"In my view the cause of death is most appropriately considered "undetermined" following post mortem. At autopsy there was no evidence of any specific pathological process which could be invoked as the cause of Ms Killen's death. Toxicological analysis detected paracetamol but no other drugs or poisons. Post mortem biochemistry revealed a variety of abnormalities. The creatinine and urea were elevated which is seen in cases of renal impairment and/or dehydration however the electrolyte profile is certainly not classical for dehydration in that the sodium and chloride levels were low (which generally occurs as a normal post mortem phenomenon). Moreover post mortem biochemistry needs to be interpreted with caution due to the confounding variable of artefact. A serum tryptase was elevated at 88.2ug/L. Whilst such elevation can occur in a setting of anaphylaxis, spurious elevations also occur (in the absence of any acute allergic reaction) and thus in the absence of a good historical exposure to a specific allergen I would be reluctant to invoke anaphylaxis as a contributing factor purely on the basis of an elevated post mortem tryptase."*

11. He further commented:

*"... there are a number of possible explanations for sudden unexpected death in a young person and the so called negative autopsy. These include various disorders of the cardiac conduction system such as Long QT syndrome, Brugada syndrome, WPW and CPVT (catecholaminergic polymorphous ventricular tachycardia). Various metabolic and/or biochemical derangements are also notoriously difficult to confirm at autopsy."*

12. Dr Lynch reported that there were no obvious injuries, nor apparent natural disease, which may have caused or contributed to death and the toxicological analysis did not reveal the presence of any drugs of the type analysed.
13. Dr Lynch commented upon the possibility of hyponatraemia being the cause of Ms Killen's death. Hyponatraemia is a condition arising from low serum sodium. It is often associated with excess hydration leading to a diminution or imbalance of serum electrolytes and has been suspected as being associated with unexplained sudden death in otherwise fit persons engaging in extreme or arduous activity or sports.
14. Dr Lynch was provided with information from a medical practitioner who had recently trekked the Kokoda Track and had rendered medical assistance to a gravely ill Australian trekker. The patient survived but was noted to be severely hyponatraemic (low serum sodium). The doctor raised the possibility that such a mechanism may have contributed to Ms Killen's death. Dr Lynch stated: