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2077

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19 January 2023

Ms Caitlin Healey-Nash
Senior Solicitor, Solicitor Assisting the Inquiry
Special Commission of Inquiry into LGBTIQ Hate Crimes
GPO Box 5341
Sydney, NSW 2001

Dear Ms Healey-Nash

RE: Special Commission of Inquiry into LGBTIQ Hate Crimes: Expert report in relation to Samantha Raye

Thank you for asking me to prepare a report in relation to Ms Raye's death to assist the Inquiry.

I acknowledge receipt of the following documents, which I have reviewed in detail:

1. P79A report of death to coroner dated 21 March 1989.
2. Handwritten autopsy notes dated 22 March 1989.
3. Microscopic examination of brain dated 12 May 1989.
4. Toxicology report dated 24 May 1989.
5. Post-mortem report of Dr P Bradhurst dated 23 June 1989.
6. Death certificate dated 6 July 1989.
7. Statement of Wayne Hurrell dated 20 March 1989.
8. Statement of Dr P Steinhauer dated 14 April 1989.
9. Statement of Dr E Grieve dated 3 May 1989.
10. Statement of Constable W J Wilcher dated 8 May 1989.
11. Crime Scene Photographs dated 20 March 1989.
12. Post-mortem photographs dated 22 March 1989.

I, Prof John Carter, acknowledge for the purpose of Rule 31.23 of the Uniform Civil Procedure Rules 2005 that I have read the Expert Witness Code of Conduct in Schedule 7 to the said rules and agree to be bound by it.

Brief History

On 20 March 1989, Ms Raye's body was found in a cave below Hornsby Lighthouse at South Head, Sydney. Ms Raye was a male-to-female trans-sexual person, who had had gender reassignment surgery in 1988. When the body was detected, a large syringe and needle was found 1.5 metres away. There was also an empty syringe packet and empty lance packet 1.5 metres away. An empty box labelled "Mixtard" was found 5 metres from the body. A plastic bottle similar to a film case was found next to the body, containing a white substance. Additionally, a package containing four Valium tablets 5 mg was found underneath the body and the container in which these four tablets were found, had a capacity for six tablets. A subsequent search of Ms Raye's home revealed "a number of syringes identical to the syringe found near her body", but no insulin was found.

The documents provided to me indicate that there is doubt as to whether Ms Raye had insulin-requiring diabetes. Her friend and next of kin, Wayne Hurrell, stated in his report dated 20 March 1989 that shortly after meeting her (in 1986), "I found out she suffered from diabetes and asthma and she used to inject insulin into her behind". However, one of her GP's, Dr Peter Steinhauer in his report of 1 April 1989, indicated that he was unaware that

the she had diabetes. Another GP, Dr Edward Grieve, in his report dated 3 May 1989, stated "Samantha claimed to be a diabetic, dependent upon insulin ". She stated she was also seeing Drs Mason and Pinnock at a practice at Centrepoint in the city. There was no reference to interviews with these two doctors in the documents provided to me.

At post-mortem, there were no signs of violence and acute bilateral bronchopneumonia was detected along with some changes in the brain histology consistent with a viral infection such as mild meningoencephalitis. There was no comment as to whether or not there were pinpricks in the skin consistent with insulin injections.

The post-mortem report provided to me provided no meaningful information regarding Ms Raye's pancreas as there was "marked autolytic change". Histological analysis of the pancreas, if there had not been autolysis, may have assisted in determining whether or not she had insulin deficiency requiring insulin injections.

Insulin was assayed in unpreserved blood taken at the time of the post-mortem and this revealed a concentration of 21 micro units per ml. The urine revealed a glucose concentration of 0.9 mmol/L. Bondi Police, on 6 April 1989, provided the pathologists with a 2 ml plastic syringe (presumably found beside the body) containing a drop of fluid, which, on analysis, was shown to contain insulin. A plastic jar (presumably also found beside the body) was also provided, which contained a white, creamy paste-like liquid and this was analysed and shown to "contain insulin".

Matters to be addressed in my report.

1. Was Ms Raye's blood sugar level indicative of insulin use? If so, are you able to give an estimate of the time of use?

No measurement of Ms Raye's blood sugar level was provided. Even if blood sugar (glucose) had been estimated in her post-mortem blood, this would not have been helpful, as numerous published studies have indicated that there is a very poor correlation between post-mortem blood glucose levels and anti-mortem glucose levels. Following death, red blood cells break down, releasing glucose, and even if a person died associated with very low blood glucose levels (hypoglycaemia), the post-mortem blood glucose levels could be normal or even high.

The finding of a urine glucose concentration 0.9 mmol/L is not abnormal and is also not of benefit in determining the cause of death.

2. In your view, did the level of insulin recorded in Ms Raye's blood and/or her urine contribute to her death:

- (a). alone; or**
- (b). in conjunction with Ms Raye's severe lung infection; and/or**
- (c). in conjunction with Ms Raye's viral meningoencephalitis?**

Estimations of insulin concentrations in unpreserved blood obtained post-mortem are unreliable in the determination of the cause of death. Insulin degrades in the body after death and this is due to progressive breakdown by enzymes released during haemolysis (breakdown) of red blood cells. Depending on which vein the blood sample is taken from, insulin levels could even increase post-mortem, possibly due to diffusion of endogenous insulin from the pancreas.

It is consequently impossible to determine whether the recorded insulin level of 21 micro units per ml contributed to her death either alone, in conjunction with the lung infection or in conjunction with the meningoencephalitis.

3. If the answer to question 2 is no, was the level of insulin found in Ms Raye's toxicology too low to cause death?

If the serum insulin level had been 21 micro units per ml just prior to death, this would strongly suggest that insulin was unrelated to the cause of death. However, it is possible that a large dose of insulin had been injected into her ante-mortem, and because of post-mortem degradation, the level then progressively reduced to 21

micro units per ml. This is particularly relevant as it appears that the blood sample for insulin assay was taken a number of days after death.

If the insulin concentration at the time of death had been very high (eg >1000 microunits per ml), it may have dropped to 21 by the time the blood sample was taken. However, it is not possible to be definitive regarding this &, for reasons explained above, it therefore is not possible to comment as to whether insulin was the cause of death in this instance.

4. Please provide any other comment, within your expertise, which you consider to be relevant to the manner and cause of Ms Raye's death.

The finding of insulin in the drop of fluid found in the syringe (this syringe is presumably the syringe that was found beside the body) strongly suggests that insulin had been injected from that syringe. I can offer no explanation why there was a plastic bottle similar to a film case next to the body, which contained a white substance that was found to contain insulin.

Whether or not Ms Raye had insulin-requiring diabetes is not relevant with respect to the opinions I have given above. However, if she definitely were known to have insulin-requiring diabetes, it would be easier to explain why insulin was found beside the body.

Conclusion

All of the clinical and toxicological features found at post-mortem with Ms Raye are consistent with death secondary to an injection of a large dose of insulin. However, there are no features that unequivocally indicate that the cause of death was related to an insulin injection.

A relevant publication relating to the interpretation of blood insulin levels post-mortem is "**Insulin and Oral Hypoglycaemic Drug Overdose in Post-Mortem Investigations: A Literature Review**" by Manetti AC et al, published in **Biomedicines**. 2022 Nov; 10 (11): 2823. I will attach a copy of this publication along with my CV with this report.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'J. Carter', with a horizontal line underneath.

PROF JOHN CARTER