CASE REPORT

Michele Anne Franco,[1] *B.Sc. and Robert John Goetz,*[1] *B.Sc.*

Identification of a Phosphoglucomutase 1 (PGM 1) Variant in a Case of Murder/Suicide

REFERENCE: Franco, M. A. and Goetz, R. J., **"Identification of a Phosphoglucomutase 1 (PGM 1) Variant in a Case of Murder/Suicide,"** *Journal of Forensic Sciences*, JFSCA, Vol. 33, No. 4, July 1988, pp. 1050-1051.

ABSTRACT: A murder/suicide case is reported in which a phosphoglucomutase (PGM) 1*W9 variant was detected in a woman, her child. and from blood collected at the scene.

KEYWORDS: pathology and biology, phosphoglucomutase, homicide, suicide

In criminal casework, confirmation of suspected blood group variants is often made more difficult because of the lack of family data. An exception to this occurred recently in a case of murder and suicide in New South Wales, Australia.

Case History

The case involved a family of Southern European background. The husband and wife had separated some time previously, the children were left in the wife's custody, and the court granted limited access of the husband to his children. Subsequently, the woman, her three children, and the estranged husband were found dead in the woman's house. A coroner's court returned a verdict that the husband shot his wife, his three children, and then killed himself.

Laboratory Evidence

Blood samples from the five deceased and a number of items from around the scene were received for examination.

The results of phosphoglucomutase (PGM) typing of the five blood samples are shown in Table 1. The PGM nomenclature used was as described by Dykes et al. [*1*].

The variant samples showed by polyacrylamide gel isoelectric focusing (PAGIF) in pH 5-7 gradient a major band that focused between the PGM 1*2B and PGM 1*1A positions.

Received for publication 20 Aug. 1987; revised manuscript received 3 Dec. 1987; accepted for publication 7 Dec. 1987.

[1]Forensic biologist and senior forensic biologist, respectively, Department of Health, New South Wales, Division of Analytical Laboratories, Glebe, Australia.

TABLE 1—*PGM typing of the blood samples from the five deceased.*

	Man	Woman	Child 1	Child 2	Child 3
PAGIF pH 5-7	1A2B	1A variant	1A2B	1A	2B variant
Electrophoresis pH 7.4	2-1	2-1	2-1	1	2

This variant band was found in the woman, Child 3, and in blood from the scene. The variant was later identified as PGM 1*W9 by comparison with a known example of this variant as tested in a reference laboratory.

Discussion

Dykes et al. [*1*] and Dykes and Polesky [*2*] found that PGM 1*W9 could be demonstrated by isoelectric focusing (IEF), but could be mistyped by conventional electrophoresis since PGM 1*W9 migrated close to the PGM 1 2 area. In the present case, conventional electrophoresis did not clearly differentiate between the mother's blood and a PGM 1 2-1 control. It was only when the samples were subjected to PAGIF in pH 5-7 gradient that a variant band was identified.

In forensic science casework, limited sample and lack of family data usually preclude the verification of a blood group variant. In many cases, the presence of a "variant" band might be attributed to some sort of degradation process. In this case, however, the family data and the presence of the variant in the blood deposited around the scene strongly supported the identification.

Acknowledgments

The authors wish to thank Dale Dykes of the Memorial Blood Center of Minneapolis for the identification of the PGM 1*W9 variant.

References

[*1*] Dykes, D. D., Kuhnl, P., and Martin, W., "PGM 1 System. Report on the International Workshop, October 10–11 Munich, West Germany," *The American Journal of Human Genetics*, Vol. 37, No. 6, 1985, pp. 1225–1231.

[*2*] Dykes, D. D. and Polesky, H. F., "Comparison of Rare PGM_1 Variants by Isoelectric Focusing and Conventional Electrophoresis: Identification of Five New Variants," *Electrophoresis*, Vol. 2, No. 5-6, 1981, pp. 323–326.

Address requests for reprints or additional information to
Robert Goetz
Division of Analytical Laboratories
42-50 Parramatta Rd.
Glebe, N.S.W., 2037 Australia