PBG screening availability during an acute porphyric crisis

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Introduction

The acute porphyrias (acute intermittent porphyria, variegate porphyria and hereditary coproporphyria) arise from genetic abnormalities in the biosynthesis of haem and may give rise to accumulation of porphyrins and/or precursors.

An acute porphyric crisis is uncommon, but attacks are serious and require immediate treatment to prevent harm or fatality. Most cases present with acute abdominal pain, however, symptoms of autonomous, peripheral and central neuropathy are also recognised. Prompt and accurate screening for urinary porphobilinogen (PBG) is central to the biochemical diagnosis of an acute porphyric episode. If positive, attacks can be halted with administration of haem arginate, withdrawal of porphyrinogenic drugs and other trigger factors. A negative PBG result, in the presence of acute symptoms, effectively rules out the condition.

We sought to determine the availability of PBG testing in the acute setting.

Method

In 2022 the RCPAQAP/AACB Porphyrins Advisory Committee, surveyed laboratories in Australia and New Zealand enrolled in the General Serum Chemistry EQA program. Information on the availability, methodology and reporting of laboratory results relating to urinary PBG screening was collected.

Results

516 primary contacts were invited to participate in this survey. Twenty nine responses were received.

90% of respondents serviced an emergency and/or intensive care unit.

15 laboratories perform PBG testing in-house. Of these 87% had a turn around time (TAT) within 24 hours. (See Fig 1)

13 laboratories refer PBG testing to another laboratory. Of these, 2/13 (15%) had a TAT within 24 hours. (See Fig 1). Reasons for not offering PBG screening in-house included low incidence and lack of mandate in local guidelines.

Of the laboratories who submitted their methods, seven used a semi-quantative method with resin clean-up and five used the Hoesch test. (See Fig 2). Noting there were no submissions for the Watson Schwartz no resin clean-up methodology.

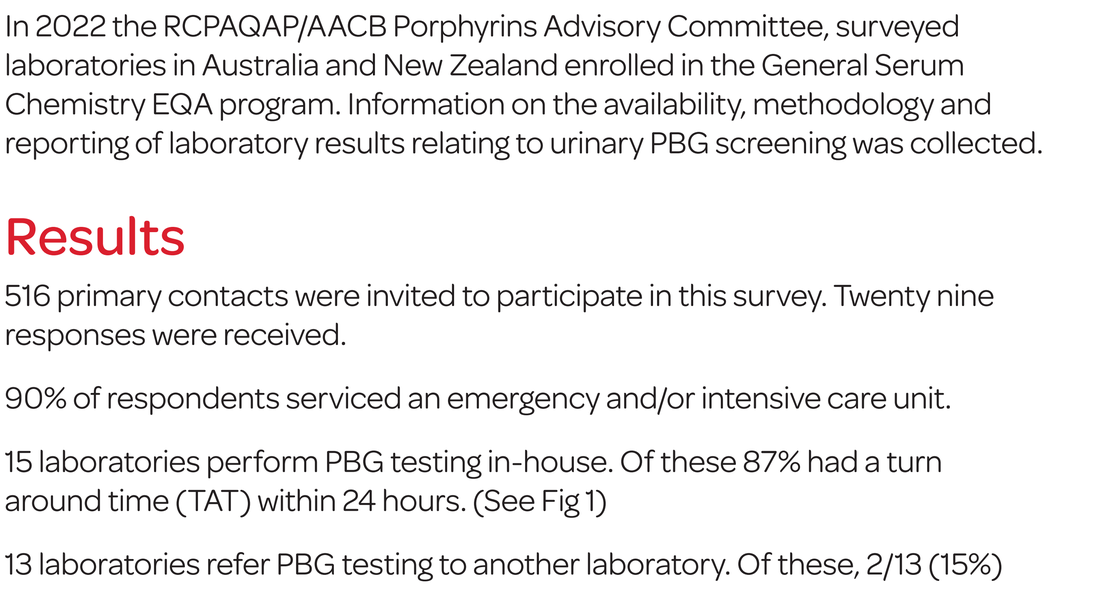

Figure 1. Turn-around-time (TAT) of Urine PBG screening (in-house and externally referred tests).

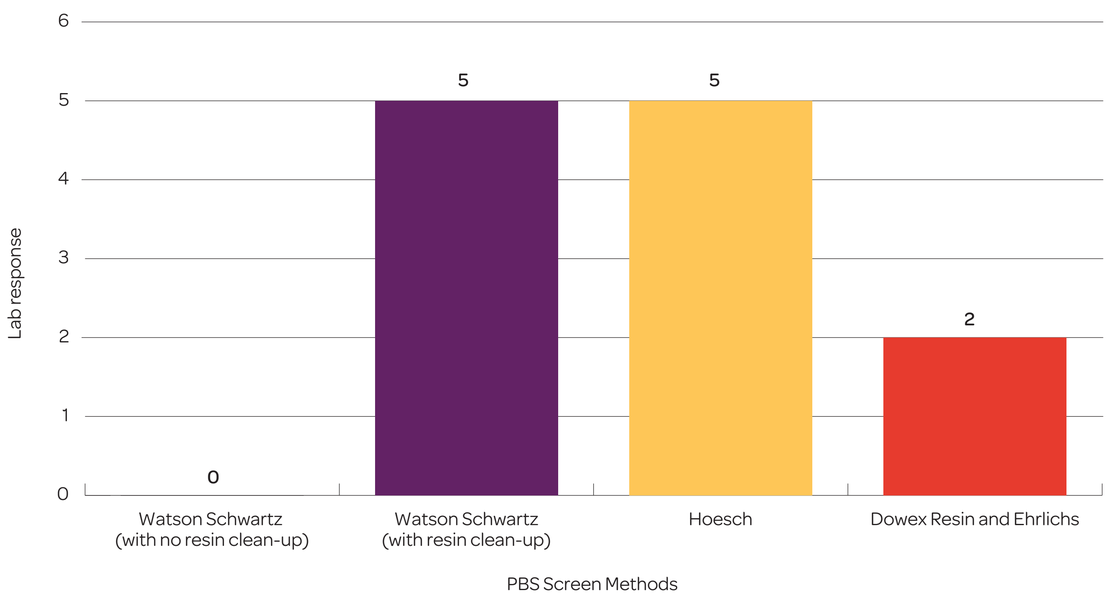

Figure 2. Methods used for Urine PBG screening.

Discussion

The paper "Best practice guidelines on first-line laboratory testing for porphyria" was published in 2017, representing a consensus of clinicians and scientists in the British and Irish Porphyria Network (BIPNET; www.bipnet.org)[1]. It stated that the investigation for an acute attack should include:

- Urgent porphobilinogen testing available **within 24 hours** of sample receipt at the local laboratory. Total Urine Porphyrin (TUP) excretion should subsequently be measured on this urine.

Forty six percent of respondents do not offer urgent (within 24 hours) urinary PBG testing, despite the majority of services having emergency or critical care areas.

The guidelines recommended against qualitative screening methods such as the Hoesch method due to low sensitivity and specificity. Semi-quantitative methods with resin clean up perform better but weren't specifically recommended due to the withdrawal of a commercial kit. The majority of laboratories surveyed are using semi-quantitative methods with resin clean up. This should offer adequate sensitivity and specificity for the detection or exclusion of an acute porphyria.

Conclusion

Survey responses indicate that there is limited in-house urine PBG screening in laboratories servicing acute care facilities in Australasia. When samples are externally referred, the TAT exceeds 24 hours in the majority of cases.

Timely access to appropriate testing is critical to avoid unnecessary delays in diagnosis for potentially life-threatening acute porphyric crises and to facilitate appropriate intervention.

References:

1. Woolf J, Marsden JT, Degg T, Whatley S, Reed P, Brazil N, Stewart MF, Badminton M. Ann Clin Biochem. 2017 Mar;54(2):188-198. doi: 10.1177/0004563216667965. Epub 2017 Jan 19. PMID: 27555665

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