Patient Safety Alert

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Stage One: Warning
Risk of harm relating to interpretation and action on PCR results in pregnant women
23 June 2014

Alert reference number:	NHS/PSA/W/2014/012
Alert stage:	One - Warning

Hypertension poses significant risks to both mother and baby and if left untreated, can lead to severe harm or death.

Testing for the presence of protein in urine is part of standard care for pregnant women with suspected or confirmed hypertension and pre eclampsia. Ensuring that hypertension and proteinuria are correctly identified and managed is essential to prevent avoidable harm to mother and baby.

An incident has been reported through the National Reporting and Learning System (NRLS) relating to the misinterpretation of tests taken for protein in urine. This incident involved the misinterpretation of 400 as being 400mg of protein per 24 hours (indicating borderline proteinuria) instead of a Protein Creatinine Ratio (PCR) of 400mg/mmol (indicating severe proteinuria).

A number of methods for urine testing for protein are in use. These methods include:

1. A 'urine' dipstick where the result would be expressed as one or more **"+" symbols**. This is a point-of-care test with immediate results and is used as an indicator of the necessity for further investigation or intervention.
2. A 'spot urine PCR' where a single urine sample is taken and processed in the laboratory. The result would be expressed as **mg/mmol**. Some laboratories choose to report the PCR in **mg/mmol** <u>as well as</u> **mg/mg**. The mg/mg result directly correlates with g/day in a 24 hour urine which can aid interpretation. A spot PCR of greater than 30mg/mmol will usually lead to a 24 hour protein test.
3. A '24 hour' urine collection where the urine would be processed in the laboratory and where the result would be expressed as **mg/24 hours**. Normal results are less than 300mg/24hrs or 0.3g/24hrs.
4. Any urine sample where the result is expressed as g/litre (unhelpful as dilution is not accounted for).

The concurrent use of tests with different thresholds increases the risk of human error, and in the incident above the spot PCR was misinterpreted as being the result for a 24 hour urine collection. A search of the NRLS suggested that the risk of confusion between methods of testing for protein in urine with different thresholds was not unique to the trigger incident. The potential for severe harm is high.

The incidents located described incorrect reporting of the values or unit of measurement relating to the method of testing, and failure to always include clear reference ranges as guidance for the clinician reviewing the test result. Results communicated verbally between laboratories and clinicians appeared particularly vulnerable to error. Additionally, incidents described delay in laboratories reporting an abnormal result or failure to act on abnormal results once reported by the laboratory.

NICE guidance available at:
http://guidance.nice.org.uk/nicemedia/live/13098/50416/50416.pdf

Actions

Who: All services involved in ordering, processing, issuing and receiving urinary protein measurements in pregnancy

When: As soon as possible but no later than 31 July 2014

1 Disseminate this Alert to all those involved in ordering, processing, issuing and receiving of urinary protein results in pregnancy - including midwives, obstetricians and pathology staff.

2 Establish if there is a risk of misinterpretation of a quantified urinary protein result in your services and if similar incidents have occurred. This includes results reported in any format, *including handwritten*.

3 Consider whether immediate action needs to be taken locally and develop an action plan, if required, to decrease the risk of the occurrence of a similar incident, including strengthening local systems for safely communicating, recording, escalating and acting on abnormal results for all methods of quantifying proteinuria in pregnancy.

4 Share any learning from local investigations or locally developed good practice resources by emailing: patientsafety.enquiries@nhs.net.

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