Quality Manager
Pathology Laboratory
Biochemistry Department
Town
County

Increasing numbers of Participants are experiencing some difficulty in receiving our notification e-mails to Trust-based e-mail addresses. To ensure that we can contact you by e-mail (and maintain contact with you if you should move to another Trust) we are asking Participants with Trust-based e-mail addresses to provide us with an alternative (non-Trust-based) e-mail address. Please notify us of this by sending an e-mail to birminghamquality@uhb.nhs.uk, remembering to state your Participant (BAnnnn) number. (We can accommodate a maximum of two e-mail addresses per Participant.) We would suggest that groups supply us with an e-mail address for each of two different members of their group.

Thank you

Jane French
Scheme Manager

The e-mail address (or addresses) we are currently using to contact you is shown below. If no e-mail address is displayed or the information shown is incorrect, please email us with an appropriate contact e-mail address as soon as possible.

Since the scheme is designed to be *'paper-free'* , please direct any email queries to birminghamquality@uhb.nhs.uk

The commentary on this distribution has been prepared by the Programme Director and is now available. This final report, including the full commentary, replaces the interim report that had previously been published.

Final report authorised on Thursday 19 April 2018 by:

Jane French
Programme Manager, UK NEQAS for Interpretative Comments

Participants are expected to return comments for a minimum of 50% of Cases. Therefore, you must have commented on at least 6 out of the previous 12 Cases.
Participants need to have been registered for at least 6 Cases before a return-rate is calculated.
Participants must achieve a rolling time-window score of 0.5 or above to pass the time-window score criterion.

You have participated in Cases out of a possible Cases.
You are currently passing the 50% return-rate criterion.
You do not have a time-window score.

Published at 13:29 on Tuesday 19 June 2018

A 55 year-old lady visited her Family Doctor. The clinical details on the request form were 'TATT'.
Serum results were as follows:

Sodium 133 mmol/L (133 - 146), Potassium 4.6 mmol/L (3.5 - 5.3), Urea 4.7 mmol/L (2.5 - 7.8),
Creatinine 101 umol/L (50 - 98), eGFR 48 ml/min/1.73sqm (>90), Cholesterol 13.8 mmol/L (<5.0),
Triglycerides 2.2 mmol/L (0 - 1.7), HDL-cholesterol 2.3 mmol/L (>1.2), LDL-cholesterol 10.5 mmol/L (<3.3),
Free T4 6 pmol/L (9 - 19), TSH >100 mU/L (0.35 - 5.0).
The TFTs were similar 7 months previously and the eGFR was 43 ml/min/1.73sqm. The only previous cholesterol result was 10 years ago when the serum cholesterol was 4.5 mmol/L.

Participants were asked to provide the comment that they would append to the report.

Your PTS is 1.49
[Participant Time-window Score]

(the mean of all your PCMs during the 12-case time-window)

Median PTS at this case for all participants is 1.51

Your comment

Primary hypothyroidism may explain why cholesterol is so high. eGFR low for age. (Both may cause TATT). Suggest Ix/refer re CKD (assuming not e.g. ACEI/ARB related), and commence on thyroxine, repeating lipids when adequately replaced.

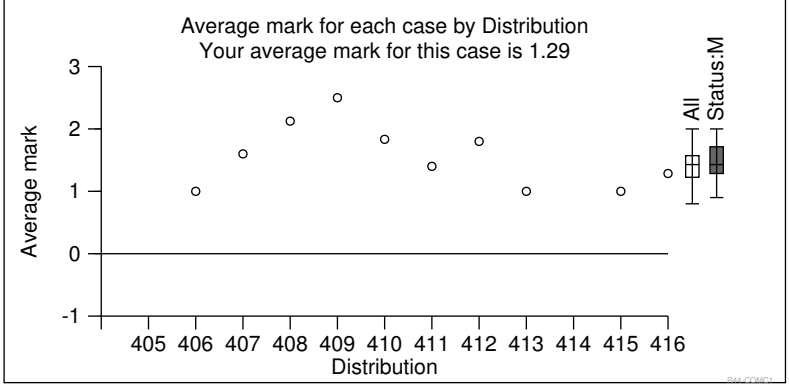
Your PCM is 1.29
[Participant Case Mark]

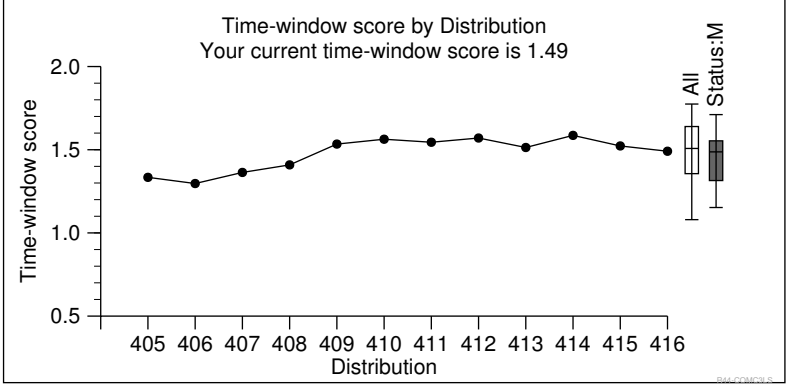
(the PCM is the mean mark awarded to you for case 416)

Median PCM for this case for all participants is 1.43

Summary from the Scheme Organisers

Please see overleaf





You have participated in 10 Cases out of a possible 12 Cases.
You are currently passing the 50% return-rate criterion.
Your time-window score is 1.49. You are currently passing the rolling time-window score criterion.

Published at 13:29 on Tuesday 19 June 2018

Summary from the Programme Organisers

This case attracted 315 participants, with 313 receiving a positive mark (25th percentile 1.23, median 1.43, 75th 1.57.

Almost all participants commented that the hypercholesterolaemia was likely to be secondary to hypothyroidism. However fewer comments mentioned that hyponatraemia and the renal impairment may also be related to hypothyroidism. Nephrotic syndrome was mentioned as a possible co-existent pathology by 28 participants and 24 comments discussed familial hypercholesterolaemia (FH) as a possible diagnosis. The assessors commented that they thought that FH was unlikely in view of the previous normal cholesterol. Those comments which advised caution with prescribing statins or advised repeating the lipid profile once the patient was euthyroid tended to score well.

A range of additional tests were suggested by participants but the most frequently mentioned were cortisol, thyroid peroxidase autoantibodies and urine protein:creatinine ratio.

Dyslipidaemia, hyponatraemia and reversible increases in serum creatinine are all well described metabolic abnormalities in hypothyroidism. A review in UptoDate (*Surks et al, Clinical manifestations of hypothyroidism [accessed 28/3/18]*) states that reversible increases in serum creatinine may be found in up to 90% of hypothyroid patients. Dyslipidaemia is also very common in overt hypothyroidism – hypercholesterolaemia being present in 56% of patients and combined hypercholesterolaemia and hypertriglyceridaemia in 34% with only 8.5% patients having a normal lipid profile. There is evidence that only patients with TSH >10 mU/L have an improvement in the lipid profile following thyroid hormone replacement. As there is an increased risk of rhabdomyolysis the BNF recommend *"Hypothyroidism should be managed adequately before starting treatment with a statin."* (BNF App Version 1.3.7 [accessed 28/3/18]).

In the event this patient was known to have hypothyroidism, following treatment for thyrotoxicosis, and there is a long-standing history of poor compliance with thyroxine replacement. There were several results in the hospital record which showed fluctuating TSH levels whilst on thyroxine replacement. Interestingly there was a positive correlation between the serum creatinine and serum TSH but there were no other cholesterol measurements during this period.

Lower scoring comments were:

'The TSH results indicate patient is hypothyroid. Suggest thyroid replacement therapy & repeat TFTs in 6 weeks. Treatment with Thyroxine can help lower cholesterol levels. Statins can be given to lower cholesterol. Suggested tests include TPO & TRAb.' and 'The patient is severely hypothyroid which may contribute to the elevated cholesterol. Familial hypercholesterolemia should be considered and DNA/LDL receptor studies undertaken. If indicated, high intensity statins or PCSK-9 inhibitors used to treat.'

Median scoring comments were:

'Consistent with secondary dyslipidaemia from severe hypothyroidism. If on thyroxine, check adherence/absorption. Dyslipidaemia corrects slowly over several weeks of thyroxine replacement. Endocrine review advised. CK & cortisol added.' and 'Hypothyroid picture with dyslipidaemia. Review for other secondary causes e.g. alcohol, diabetes, obesity. Once

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hypothyroidism has been treated recheck lipids and consider need for statins and/or specialist referral (see NICE CG181).'

High scoring comments were:
'Gross hypothyroidism is linked to high total & LDL chol, reduced eGFR & hyponatraemia. Chol 10 years ago suggest FH unlikely. Review patient & drugs promptly & start thyroid replacement. In 6-8wk check TFTs, lipids, U&E, eGFR & refer if not improved.' and 'Hypothyroid with secondary effects on renal function and secondary hypercholesterolaemia.
Suggest urgent treatment of hypothyroidism and followup renal and lipid tests once Euthyroid state has been achieved.'

Best wishes
Jacqui, Jane, Aimee, and Anne-Marie

You require a minimum of six data points to have a time-window score. Since the marks are allocated for added value, all positive scores reflect added value the higher the mark, the better! The 25th, 50th and 75th centiles are currently 1.36, 1.51 and 1.64 respectively.