

Abnormal Blood Results In General Practice

ST 2 Small Group 05/12/12

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Overview:

- ▶ Management of abnormal blood results in Primary Care is different to hospital:
 - Less acceptable/practical to perform 'regular' blood tests on patients
 - Delays in receiving/interpretation of results
 - Less easy to access specialist opinion
- ▶ Significant part of daily workload for practising GPs – important to ensure in your practice that you are receiving the results of tests that you order

Objectives Of Session:

- ▶ To look at some common examples of borderline/abnormal blood results
 - ▶ To work through some scenarios in groups of 2 or 3 with discussion of each case in the large group
 - ▶ To revise some general principles and theory around common abnormalities
 - ▶ To complete some AKT style practice questions on the theme
 - ▶ To discuss any difficult/noteworthy/ problematic results that you have had to deal with
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Thyroid Quiz 1

- ▶ Alexa is found to have a High TSH 12, with a low T4,
 - ▶ Diagnosis? Specific Action?

- ▶ Mary is found to have a High TSH of 9.1 with a normal T4
 - ▶ Action?
 - ▶ A) treat with thyroxine
 - ▶ B) do nothing
 - ▶ C) repeat in 3 months

Borderline hypothyroid 2

- ▶ Alexia, answer Start thyroxine 50mcg.
- ▶ Mary, answer C, repeat with TP antibodies.
- ▶ Treat if TSH is above 10

Thyroid 3

- ▶ When should we recheck Alexia's thyroid tests?
- ▶ Alexia tells you that she hopes to become pregnant this year, does this affect your management?
 - ▶ A) No
 - ▶ B) Increase the thyroxine
 - ▶ C) Reduce the thyroxine

Trisha

- ▶ You are checking your colleagues bloods on a Friday pm,
- ▶ You see that this patient has a TSH of <0.02 and a T4 of 60. (raised)

- ▶ What is the diagnosis?
- ▶ What other tests are helpful?
- ▶ Other Questions to ask?
- ▶ Treatments?
- ▶ Cautions?

Case 1: George O'Dowd

- ▶ You receive a blood test for Mr GO, a 56 year old man with a BMI of 33. He is fit and well, and has no symptoms:

Glucose (fasting) 7.1

- ▶ You look at previous results and the last 2 fasting results were : 6.8 (a month ago, at a private screening clinic) and 5.6 (2 years ago).
- ▶ What would you do?

Diagnosis Diabetes:

- ▶ Diabetes is diagnosed on the basis of history (ie polyuria, polydipsia and unexplained weight loss) PLUS
 - a random venous plasma glucose concentration ≥ 11.1 mmol/l
 - OR a fasting plasma glucose concentration ≥ 7.0 mmol/l
 - OR 2 hour plasma glucose concentration ≥ 11.1 mmol/l 2 hours after 75g anhydrous glucose in an oral glucose tolerance test (OGTT)
- ▶ In the absence of symptoms 2 results from different days are required

Impaired Fasting Glycaemia

- ▶ Fasting plasma glucose ≥ 6.1 but < 7.0 mmol/L
- ▶ British Dietetic Association recommends all should have glucose tolerance test
- ▶ ?2.2% relative annual risk progression to diabetes (?higher), remember gestational.
- ▶ Manage risk factors and arrange annual follow up
- ▶ BUT – in a 2011 report the WHO recommends that HBA1c $> 6.5\%$ can be used to diagnose diabetes. This is not currently accepted practice in the UK

Case 1:Continued

- ▶ After assessing GO's cardiovascular risk you decide you'd like to initiate a statin for him, but notice his last LFTs 2 years ago were slightly abnormal:

▶ AST	68	(8-40)
▶ GGT	102	(11-50)
▶ ALP	114	(30-170)
▶ Bili	14	(3-17)
- ▶ What actions (if any) would you take? Would you start the statin?

Mildly Deranged AST/GGT

- ▶ Can raise transiently due to viral infection, drugs or alcohol
- ▶ Consider Hx alcohol/recreational drug use (also penicillins/antifungals/statins/ anti-epileptics/NSAIDs/herbal medicines)
- ▶ Hepatitis screen: Hep (A)/B/C; ferritin; +/- EBV/ autoantibodies/ (alpha-1 antitrypsin/ caeruloplasmin)
- ▶ USS (?)

Statins and Deranged AST

- ▶ Baseline reading recommended, if stronger than pravastatin/simvastatin 40mg daily repeat 3 and 12 months
- ▶ If abnormal look for cause cirrhosis
- ▶ Trial without statin if >3 times upper limit normal AST/GGT
- ▶ Consider initiation even in patients with cirrhosis as proven benefits and no confirmed risks
- ▶ What is the most common cause of deranged LFTs in the UK?
- ▶ Non-alcoholic fatty liver disease (though alcohol commonly implicated also!)

Case 2: Taylor Dane

- ▶ TD is a 40 year old woman with a history of non-specific abdominal pain. She has been treated for IBS for the last year. When she sees you she tells you that she has felt 'fluey' and had no energy for the last 2 weeks. You notice she has not had any blood tests before and you arrange a 'tired all the time' blood screen. This is all normal except for the following LFTs:

▶ AST	24	(6-34)
▶ GGT	46	(11-50)
▶ ALP	160	(30-170)
▶ Bili	36	(3-17)

- ▶ What would you do?

Case 2: Continued

- ▶ You decide to repeat the test a month later. When she comes in for the result you notice that she looks a little more yellow...



▶ AST	40	(6–34)
▶ GGT	80	(11–50)
▶ ALP	260	(30–170)
▶ Bili	60	(3–17)

- ▶ What would you do next?

Raised Bilirubin

- ▶ Gilbert's: Raised unconjugated bilirubin; mild or no symptoms; if <3 times ULN interval retest and if no signs haemolysis or other disease no further testing required
- ▶ Most patients without Gilbert's Disease or self limiting virus will require referral
- ▶ Consider haemolysis as cause of raised bilirubin, make sure you have checked FBC/reticulocytes
- ▶ Obstructive causes: gallstones; cancer; primary biliary cirrhosis; primary sclerosing cholangitis

Raised Alk Phos

- ▶ Source may be the liver/bone/gut/kidney or placenta
- ▶ Causes: cholestasis or hepatic disease; bone mets or Pagets; puberty; pregnancy
- ▶ Investigate with liver screen, ultrasound scan and autoantibody screen
- ▶ If asymptomatic, normal liver screen/USS and raised by $<50\%$ could consider observation, otherwise refer

Case 3: David Roth

- ▶ DR is a 72 year old man with a past history of: hypertension; an MI 3 years ago; COPD . He is a smoker and you notice he has a long list of medications. He came in as the receptionist said that his salt level was low. His U&Es were:
 - Na 128 (135–145)
 - K 4.8 (3.5–5.2)
 - Creat 105 (60–120)
- ▶ How would you manage this result?
- ▶ You repeat the test a month later and his sodium is now 124. What further investigations would you like to arrange?

Hyponatraemia- Causes

- ▶ Loss of body sodium:
 - Diuretics (esp thiazide)
 - Diarrhoea/vomiting/burns
 - Addison's disease

- ▶ Increased body water:
 - Chronic heart failure
 - Liver cirrhosis
 - Nephrotic syndrome
 - Excessive water intake
 - SIADH -persistently concentrated urine (urine:serum osmoles);normal renal and adrenal function; no oedema or hypovolaemia
 - Several causes SIADH - lung pathology, neoplastic, or intracranial pathology.

Case 4 – ‘Busy on call’

- ▶ You are the duty doctor at the surgery and a fax comes in from the biochemistry lab. JF is a 60 year old diabetic who had routine blood test at the surgery:



▶ Na	137	(135–145)
▶ K	6.2	(3.5–5.2)
▶ Creat	122	(60–120)



- ▶ What would you do?

Raised Potassium

- ▶ Causes of hyperkalaemia
 - Artefactual
 - Metabolic Acidosis
 - Addison's disease
 - Renal Failure
 - Drugs – potassium sparing diuretics; ACEi; NSAIDs; beta blockers
 - Haemolysis
 - Hyperkalaemic periodic paralysis
- ▶ Management: Confirm genuine result; treat the cause; normally admit if >6.5

Case 4 – Continued

- ▶ A few minutes later you receive another fax from the lab, results for BK, a 67 year old lady with heart failure who was seen last week with diarrhea and vomiting:
- ▶
- ▶ Na 132 (135–145)
- ▶ K 2.4 (3.5–5.2)
- ▶ Creat 70 (60–120)
- ▶
- ▶ What action would you take?

Low Potassium

▶ Causes of hypokalaemia:

Diuretics

Vomiting/diarrhoea

Conn's syndrome

Fistula

Cushings syndrome/ steroids

Renal tubular failure

Rectal adenoma

Hypokalaemic periodic paralysis

▶ Management:

◦ Admit if $K^+ < 2.5$

◦ Consider oral potassium supplement if < 3 (but poorly tolerated due to nausea)

◦ If > 3 and on thiazidediuretic rarely needs treatment (Oxford GP Handbook)

Case 5: Paul Buchanan

- ▶ You receive the following for PB, a 67 year old diabetic man who had some routine blood tests. He takes aspirin, bendroflumethiazide, atenolol, and metformin, and is fit and well other than diabetes. His results are:

▶ HBA1c	8.1%	
▶ Creat	134	(60–120)
▶ eGFR	40	(>90)
- ▶
- ▶ His last creatinine was taken 2 years ago and was 106 (no eGFR was reported at the time). What would you do?

Case 5: Continued

- ▶ PB sees you again after some repeat tests. The second eGFR was 37, his creatinine was 142, and you also notice from his blood results that he was slightly anaemic (normocytic) with a haemoglobin of 12.3. His albumin/creatinine ratio on the urine sample was 32 mg/mmol.
- ▶
- ▶ What would you do in the consultation and what follow up would you arrange?

NICE CKD Guidance (2008):

- ▶ **DIAGNOSIS:**
- ▶ At diagnosis: First eGFR <60 you should re-test within 2 weeks, and obtain an ACR, confirmed on an early morning ACR after first abnormal result (if not early morning sample)
- ▶ ACR >30 indicates proteinuria. In diabetics microalbuminuria considered significant (ACR >2.5 in men, >3.5 in women)
- ▶ Test for haematuria using reagent strips. Investigate appropriately if persistent (2 of 3)

NICE CKD – Management

- ▶ Education and lifestyle advice
- ▶ Monitor progression (6 monthly in CKD stage 3)
- ▶ Offer renal ultrasound in stage 3 CKD if:
 - Haematuria present
 - Progressive CKD (>5 /year or $>10/5$ yrs)
 - FHx polycystic kidneys
 - Outflow obstruction
- ▶ Aim to keep BP $<140/90$ ($<130/80$ if diabetic and ACR >70)
- ▶ Check Hb in stage 3B (eGFR <45)

NICE CKD– Management (stages 3 and above)

▶ **Diabetics:**

- Offer ACEi/ARB to *all* diabetics with microalbuminuria

▶ **Non-diabetics:**

- Offer ACEi/ARB to patients with hypertension and $ACR > 30$
 - Offer ACEi/ARB to *all* patients with $ACR > 70$
- ▶ Otherwise treat according to normal hypertension guidance

NICE CKD –Management (cont)

- ▶ **Refer to a specialist for:**
 - Stage 4 and 5 CKD
 - Higher levels of proteinuria (ACR \geq 70 mg/mmol) unless known to be due to diabetes and already appropriately treated
 - Proteinuria together with haematuria
 - Rapidly declining eGFR
 - Poorly controlled hypertension
 - People with, or suspected of having, rare or genetic causes of CKD
 - Suspected renal artery stenosis
 - Anaemia with Hb $<$ 11 and CKD likely cause

AKT Question 1:

- ▶ A 46 year old man with suspected diabetes mellitus has an oral glucose tolerance test, following the standard WHO protocol. The following results are obtained:

▶ Time (hours)	Blood Glucose (mmol/L)
▶ 0	5.7
▶ 2	7.6

- ▶ How should these results be interpreted?
- ▶ A. Normal
- ▶ B. Impaired fasting glucose and impaired glucose tolerance
- ▶ C. Diabetes mellitus
- ▶ D. Impaired glucose tolerance
- ▶ E. Impaired fasting glucose

AKT Question 2:

- ▶ A 52 year old man is started on simvastatin 40mg. Liver function tests are performed prior to initialising treatment, and are all normal.

- ▶ Three months later the LFTs are repeated:
 - Bilirubin 12 μ mol/L (3–17 μ mol/L)
 - ALP 107 u/L (30–150 u/L)
 - ALT 104 u/L (10–45 u/L)
 - GGT 76 u/L (10–40 u/L)

- ▶ What is the most appropriate course of action?
- ▶ A. Continue treatment and repeat LFTs in 1 month
- ▶ B. Check creatine kinase
- ▶ C. Reduce dose to simvastatin 10mg on and repeat test in 1 month
- ▶ D. Stop treatment and consider alternative lipid lowering drug
- ▶ E. Stop treatment and refer to endocrinology

AKT Question 3:

- ▶ You receive the following results for a 35 year old patient:
 - TSH 0.05 mU/L
 - Free T4 19pmol/L (9–25pmol/L)
 - Free T3 7pmol/L (3–9 pmol/L)
- ▶ If left untreated, what are the most likely possible consequences?
- ▶ A. Supraventricular arrhythmias and osteoporosis
- ▶ B. Supraventricular arrhythmias and hyperlipidaemia
- ▶ C. Hypothyroidism and impaired glucose tolerance
- ▶ D. Myasthenia gravis and hypothyroidism
- ▶ E. Impaired glucose tolerance and hyperlipidaemia