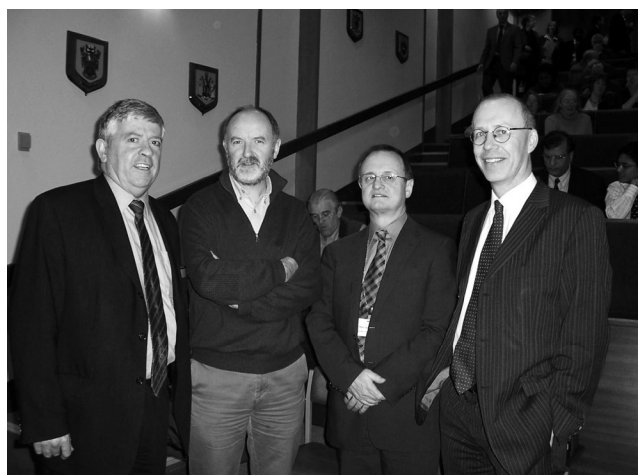


BIOCHEMISTRY STUDY DAY

A Biochemistry Study Day was held on 1st March 2006 at Furness General Hospital (FGH), courtesy of the Education Centre and Astra Zeneca. Dr Alan Taylor, consultant chemical pathologist, reports on the meeting for the Journal. He describes the contribution of Professor Ian S Young, Professor of Medicine and Clinical Biochemistry at Queens University Belfast. His lecture on the origins of atheroma, which in a masterly way condensed many years of research into one hour, ranks alongside Dr Denis Burkitt's lecture on the origins of bowel disease (the inaugural lecture in the new theatre at FGH in 1986) and Professor Nick Hales's on the origins of diabetes (presented in 1998 at FGH). The topics selected for the study day were designed for primary care staff in particular, because they have overtaken secondary care as the main users of clinical biochemistry services.



Mr RY Wilson, Dr G Murray, Dr A Taylor and Professor IS Young

Biochemistry Study Day For Primary Care

Professor IS Young (Guest Speaker):
'Lipids, the story so far'

Dr Alan Taylor:
The identifications of early renal disease
Common abnormalities in primary care

Dr Richard Neary:
Aldosteronism, Conn's syndrome and resistant hypertension

Dr Padmanna Negali, SpR, Chemical Pathology:
A case report of pancreatic disease in chronic diarrhoea
A case report of familial hypocalcuric hypercalcaemia
Discussion of the metabolic causes of diarrhoea

Dr Cathy Hay:
A review of the clinical presentation of thyroid disease

ABSTRACTS OF THE MEETING

Renal disease in the community

Dr Alan Taylor

The renal NSF (2005) addressed early renal disease and made recommendations for screening those at risk because of the increase in stage 3 renal disease.

Risk factors include diabetes, obesity, smoking, hypertension and cardiovascular disease.

Screening involves the measurement of serum creatinine, age, ethnic group and gender and provides an estimated glomerular filtration rate (eGFR). An early morning random urine (EMU) measures protein:creatinine ratio.

Management at this stage can involve the treatment of hypertension, lipids, glycaemic control, anaemia and dietary restriction of salts with promotion of fluid intake.

The massive risk of heart disease was noted in diabetic nephropathy. Pathological changes causing this were discussed. Stage 3 patients require aggressive lipid control. There is evidence that the beneficial effects of statins may attenuate as the coronary vessels undergo dystrophic calcification, so early control is important to prevent this process.

Some pitfalls were discussed. The lack of specific creatinine assays, the limited value of eGFR in secondary care (eg acute renal failure) are examples. Spurious results may be a consequence of the use of angiotensin blocking drugs such as angiotensin converting enzyme blockers (ACEI) and angiotensin receptor blockers (ARB). These can reduce the eGFR but do not, in most cases, reduce the number of functioning nephrons. Thereafter, the rate of decline in GFR is reduced because of the antihypertensive effect.

Lipids, the story so far

Prof Ian Young, Belfast

As well as discussing dietary trials such as the Portfolio Diet and use of statins in reducing low density lipoprotein (LDL) cholesterol, modification of triglyceride (TG) and high density lipoprotein (HDL) was also discussed. All these modifications are in use in all UK Lipid Clinics with genetic lipidaemias and management of ischaemic heart disease. The role of nicotinic acid and fibrates was discussed in this regard.

The evidence for further reduction of LDL was presented and, in particular, the idea that there is an LDL level at which regression of atheroma is the norm.

Metabolic cases

Dr Padmanna Negali

To illustrate the difficulties in diagnosing the cause in cases of chronic diarrhoea, a case of possible pancreatic origin was discussed. A case of purgative abuse was also presented.

Faecal elastase measurement is useful as a means of excluding pancreatic causes in cases of steatorrhoea.

A kindred with familial hypocalcuric hypercalcaemia was presented. This is an unusual case showing acute pancreatitis in two family members and urolithiasis in one.

Thyroid disease: clinical aspects

Dr Cathy Hay

Salient points in the diagnosis and management of hypothyroidism and hyperthyroidism were presented with illustrative cases. The situations where thyroid peroxidase antibody measurement may be helpful were outlined. Pregnancy and thyroid disease was discussed and potential referral to secondary care suggested in these scenarios. An overview of amiodarone-induced thyroid disease was presented and the need for thyroid function testing pre-treatment and every six months during treatment explained. Distinguishing thyroid damage and iodine excess is important and requires endocrine advice.

Secondary hypertension: Conn's syndrome

Dr Richard Neary

Primary hyperaldosteronism is not as rare as it may seem. It is characteristically resistant to antihypertensive treatment and though commoner as age progresses it is seen in younger patients also. Screening may be rendered easier by measuring plasma aldosterone and this can be carried out in general practice although this will not detect all patients. The aldosterone:renin ratio can then be reserved for borderline cases and orthostatic/supine tests only used to establish whether there is a surgically resectable, functional adenoma on CT scanning.

Hypokalaemia is present in about 50% of cases and alkalosis in a greater number but resistant hypertension is the main indication.

The types were discussed: autonomous adenoma/ACTH-dependent adenoma and hyperplasia. Treatments involve surgery or medical with diuretics acting on the distal tubule such as amiloride and spironolactone.

Primary care biochemistry investigations: a simple guide

Dr Alan Taylor

The proportion of requests from primary care is increasing and over the last 20 years locally has doubled to over 50%. Three areas were discussed with reference to what evidence base is available. The following notes describe current recommendations:

Thyroid function tests

- Routine screening of adults is not recommended
- Screen postmenopausal women with a complaint related to hypothyroidism
- Diabetics should be screened annually
- Type 1 diabetic women: screen before booking and again within six weeks if borderline
- New onset Type 1 diabetes in non-obese middle-aged women
- Increased low density lipoprotein (LDL) cholesterol
- Depression with hypothyroid features

Lipids

- Normotensive non-smoking non-diabetic women under 50 years without a positive family history of coronary or vascular disease need not be screened
- Normotensive non-smoking non-diabetic men under 40 years with no positive family history of coronary or vascular disease need not be screened
- Alcohol should not be taken in the 48 hours pre-test
- Fasting lipids are requested at least initially
- Alanine aminotransferase (ALT) is required pre-statin and within six weeks of starting or dosage change
- Creatine kinase (CK) is required if a patient is myalgic at any stage
- High triglyceride (TG) may not indicate statin therapy

Electrolytes

- Suspect false if:
 - LOW Na – lipaemia, myeloma (new), specimen separated after delay. Serum osmolality is normal
 - HIGH K – delay in separation, high white blood count platelets, prolonged cuffing at venepuncture, refrigeration or transport in a cold van. High cells: heparin electrolytes are normal

- Hyponatraemia – ask for repeat with renal profile urine osmolality and Na (early morning random urine)

Calcium

- In hypercalcaemia request repeat bone profile parathormone and creatinine. Can be done if no more than three hours delay before receipt in laboratory
- In hypocalcaemia check serum Mg and creatinine initially
- Ca and phosphate should be checked in Grade 3 chronic kidney disease

Fasting glucose

- Under 6.0 mmol/l: no abnormality but does not exclude impaired glucose tolerance
- 6.1–6.9 mmol/l: impaired fasting glycaemia
- Over 7.0 mmol/l with symptoms is diabetic. Without symptoms another abnormal value is required or glucose tolerance test
- Borderline cases may require further tests on merits

Liver function tests

- Isolated gamma glutaryl transferase (GGT) has no pathological significance; it may be caused by statins, other drugs, alcohol and calorie excess
- Isolated ALT with normal GGT: look at CK to see if the ALT is coming from muscle
- Isolated alkaline phosphatase (ALP) may not be hepatic but may be of bony origin
- ALP and GGT increased: cholestatic in early liver disease
- ALT higher than ALP: as a rough guide, hepatitic (ALT usually over 100 in acute; can be less in chronic which includes Hepatitis C)
- Serum albumin is rarely normal in cirrhosis