Paediatric Pearls

June 2017

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Previous editions are all available at www.paediatricpearls.co.uk

PAEDIATRIC HYPERTENSION (HTN) continued from April 2017 newsletter

(with thanks to Ms Eileen Brennan, nurse consultant in paediatric nephrology at Great Ormond Street Hospital)

BP centile charts available here!

Prevalence of HTN in children aged 8-17 years was approximately 2.2% between 2011 and 2014. Compare this with asthma prevalence of 9%, autism 1%, epilepsy 1% and yet these all get much more air time than hypertension. Up to 30% of newly diagnosed hypertensive children and young people already have end organ damage, left ventricular hypertrophy in particular.[1]

Important points in the history:

Symptoms: lethargy, visual disturbances, headache, nausea, vomiting, failure to thrive

Past medical history: prematurity, central lines, UTIs, congenital heart disease

Family history: essential hypertension, polycystic kidneys, early CVS disease

BP measurement in babies and children is a skill which is often not done well:

Cuff size – you need a range of sizes. The bladder width needs to be at least 40% of the child's arm circumference between olecranon and acromion and 80-100% of the circumference. A small cuff leads to an erroneously high BP measurement. Take BP in the arm, not leg (both if doing 4-limb BP obviously). At birth, BP measured in the legs is often lower than in the arms, equalises at 8/52 of age and after that leg blood pressure tends to be higher than in the arm.

Position – the child should ideally be lying down, relaxed, their limb at the same level as their heart.

Equipment – centile charts are put together using auscultation and a sphygmomanometer. Mechanical oscillometric devices are easy to use (be sure to still ensure correct cuff size) but are not as accurate which is why nephrologists always insist on a "manual reading".

[1]Lewis M et al. Screening for Hypertension in Children and Adolescents: Methodology and Current Practice Recommendations. *Front Pediatr*. 2017; **5**: 51 (full text)
Great Ormond Street Hospital clinical guideline on the diagnosis, investigation and management of hypertension.

URINALYSIS – 1) specific gravity (Jan 2017), 2) pH (Feb '17), 3) nitrites (March '17), 4) leucocytes (April '17) 5) blood

- Red or brown urine does not always mean blood
- High false positive rate (eg. haemoglobinuria, myoglobinuria, concentrated urine, menstrual blood in the urine sample, rigorous exercise) so dipstick positive blood needs to be looked at under the microscope to accurately diagnose haematuria
- False negative possible if specific gravity is < 1007
- Significant haematuria is defined as ≥ 10 red blood cells (≥ 3 in adults) per high-power field in a properly collected and centrifuged urine specimen
- Isolated microscopic haematuria in a well child only really needs further investigation after 3 positive samples over a period of a few months
- Concomitant proteinuria, high BP or a palpable abdominal mass should be investigated promptly
- Possible causes of haematuria in children:
  - **UTI**
  - **Viral infections**
  - **Post streptococcal glomerulonephritis**
  - **Trauma**
  - **Henoch Schonlein Purpura**
  - Wilm's tumour (median age 3.5 years)

Click on the thumbnail for the Royal Children's Hospital in Melbourne's very sensible, easy to follow guideline for the management of children with haematuria.

Resources:

http://lifeinthefastlane.com/investigations/urinalysis/

http://labtestsonline.org.uk/understanding/analytes/urinalysis/ui-exams?start=1

http://www.mdedge.com/ccjm/article/94892/nephrology/how-evaluate-dipstick-hematuria-what-do-you-refer

http://www.rch.org.au/clinicalguide/guideline_index/Haematuria/

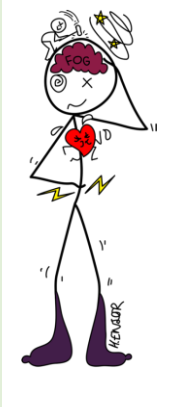
What is PoTS? Is it an illness?

It stands for Postural Orthostatic Tachycardia Syndrome, an autonomic disturbance leading to light-headedness, sweating, tremor, palpitations and near syncope in the upright position[1].

Definition:

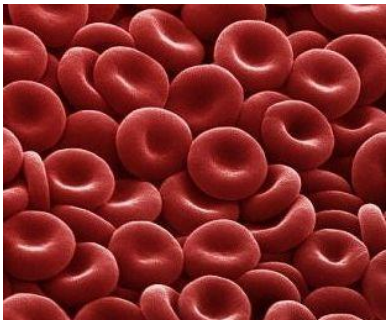
- Heart rate >120bpm on standing
- HR increase > 40bpm after 10 minutes of standing (if aged 12-19 yrs. >30bpm if older)[2]

- Despite our traditional concern with lying and standing blood pressures, it is the persistent *tachycardia* that characterises this health condition. Blood pressure may not change at all.
- Recognised in age group 12 – 50, female to male ratio of 5:1
- Can be primary (eg. adolescence) or secondary (eg. diabetes, hypermobility)
- Different types and some are associated with a particular gene mutation
- Can be diagnosed on tilt table or active stand test if necessary
- Reassurance, a healthy lifestyle with sufficient aerobic exercise and fluid intake will help with symptoms and most adolescents grow out of it



From support group, http://www.potsuk.org/

[1]Agarwal A et al. Postural orthostatic tachycardia syndrome. *Postgrad Med J* 2007;**83**:478-480
[2]http://www.nhs.uk/conditions/postural-tachycardia-syndrome/Pages/Introduction.aspx



Cheerios® breakfast cereal? No, red blood cells packed together by centrifuging.

Mean corpuscular haemoglobin (MCH) is the amount of haemoglobin per red blood cell. MCHC is an estimate of the *concentration* of haemoglobin *in a given number* of packed red blood cells.

Last in the "decoding the FBC" series by Dr Xanna Briscoe and Prof Irene Roberts for the time being:

Mean Corpuscular Haemoglobin Concentration (MCHC)

MCHC = (Hb* ÷ HcT*) x 100

Normal in children is 32-34% (adults 28-36%) depending on the lab

↓	↑
chronic anaemia **iron deficiency** **thalassaemia**	**spherocytosis** **folic acid deficiency** **Vit B12 deficiency** **burns patients** **sickle cell disease**

*Hb: haemoglobin *HcT: haematocrit or packed cell volume