05 - Specific investigations

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 defects due to maternal malnourishment.

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ELECTROCARDIOGRAM: The major use of ECG in a psychiatric ward, apart from emergency needs, is to measure QT interval when treating patients using antipsychotics. Prolonged QT can predispose to fatal ventricular arrhythmias such as torsades de pointes (polymorphic ventricular tachycardia). QTc is QT corrected for heart rate. While valuable for classifying risk groups, it is not a precise predictor of torsade de pointes as it has low positive predictive value. There are different methods to arrive at QTc from QT – these give markedly different values. As a clinical measure, the risk is said to increase if QTc is beyond normal limits (440 ms for men; 470 ms for women) – anything more than 500 ms is clearly an increased risk. QT varies with gender, time of day, food intake, alcohol intake, menstrual cycle, ECG lead used. Risk factors for prolonged QTc include • Congenital long Q-T syndrome, • Underlying heart disease, bradycardia, heart failure, and ischemic disease • Female gender, • Extremes of age, • Presence of liver disease, • Electrolyte abnormalities (hypokalemia, hypocalcemia and hypomagnesemia), • Illicit drug use (principally stimulants), • Starvation or anorexia, • High physical exertion (agitation), • High dosages of the drug contributing to the lengthened Q-T interval, and • Rapid infusion of torsadogenic drugs.
URINALYSIS: Testing for drugs: This is one of the most frequently used lab investigations in psychiatry. When a patient repeatedly gives negative urine samples despite strong suspicions, a cheap and quick way of checking the sample is by testing specific gravity – this will reveal any adulteration of urine with tap water. The following table will help answering some recurrent questions on this theme.

 Substance Time present in urine Alcohol Up to 12 hrs Amphetamine Up to 48 hours Benzodiazepine 3 days (depending on t1/2) Cannabis Occasional use – up to 3 days. High daily use for long time – up to 4 weeks. Cocaine 6 – 8 hrs; metabolites up to 2 - 4 days Codeine 48 hours Heroin 1 to 3 days Methadone 3 days or more Morphine 2 to 3 days Phencyclidine (PCP) 8 days Data from Oxford Handbook of Psychiatry & Rudolph’s Paediatrics 21e. p 230 Renal disturbances in IV drug users: Renal disease in cocaine and heroin abusers has been associated with the nephrotic syndrome, acute glomerulonephritis, amyloidosis, interstitial nephritis, and rhabdomyolysis. In a heroin user with a puffy face, hypertension and weight gain – suspect heroin-related nephropathy. Infective endocarditis, HIV, and HBV and HBC infections are associated with renal pathologic patterns similar to those that can be caused by the drug itself. In Black patients, focal segmental glomerulosclerosis is often seen while in Whites mostly membranoproliferative

glomerulonephritis is noted. SIADH: Urine analysis may be important with regard to SIADH induced by antidepressants or antipsychotics/Psychogenic polydipsia where excessive water consumption occurs without obvious organic illness and Diabetes insipidus due to lithium (nephrogenic) or head injury (central). As a rough guide use the following tables. Plasma osmolality Urine osmolali Diagnosis High (>295mosm/kg) Low Diabetes Insipidus (Central / nephrogenic) Low (<280 mosm/Kg) Low Psychogenic polydipsia Low High SIADH - hyponatraemia Psychogenic / Primary polydipsia Diabetes Insipidus Gradual onset Acute or sudden Nocturia is rare Nocturia is common Plasma osmolality normal/low Elevated plasma osmolality Urine osmolality normal/low Low urine osmolality

 Plasma ADH levels normal compared to osmolalit Low in central type NOTE - polydipsia and polyuria are not features of SIADH or hyponatraemia per se. The clinical features of SIADH are attributed to water retention, hyponatraemia, and hypo-osmolality of the serum. Most hyponatraemic patients have no symptoms or signs until the serum sodium concentration falls below 125 mmol/L. Initially, the symptoms include lethargy, muscle cramps, anorexia, nausea, and vomiting. When hyponatraemia develops more rapidly or more profoundly, coma, convulsions, and death may occur. On longer term hyponatraemia can cause neurologic signs and symptoms such as altered levels of consciousness, headache, impaired memory and confusion. If the serum sodium concentration drops below 110-115 mmol/L, seizures and irreversible brain damage can occur.

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