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The initial management and stabilisation of the newborn infant with a positive screen for congenital adrenal hyperplasia (CAH): An ANZSPED guideline.

Key points

THIS IS A GUIDE FOR BABIES RECALLED FROM THE COMMUNITY

Newborn screening for CAH is aimed at detecting classical or severe CAH due to 21-hydroxylase deficiency; mild cases may not be detected.

The screening test, elevated 17 hydroxyprogesterone (17OHP) level by immunoassay supported by an abnormal steroid profile on liquid chromatography-tandem mass spectrometry (LC-MS/MS) on the same sample, is highly specific for CAH.

Screen positive babies are at high risk of deterioration if treatment is delayed while further confirmatory biochemical or genetic tests are awaited.

Urgent consultation with a paediatric endocrinologist is recommended.

It is prudent to monitor glucose and electrolytes and start treatment as soon as possible.

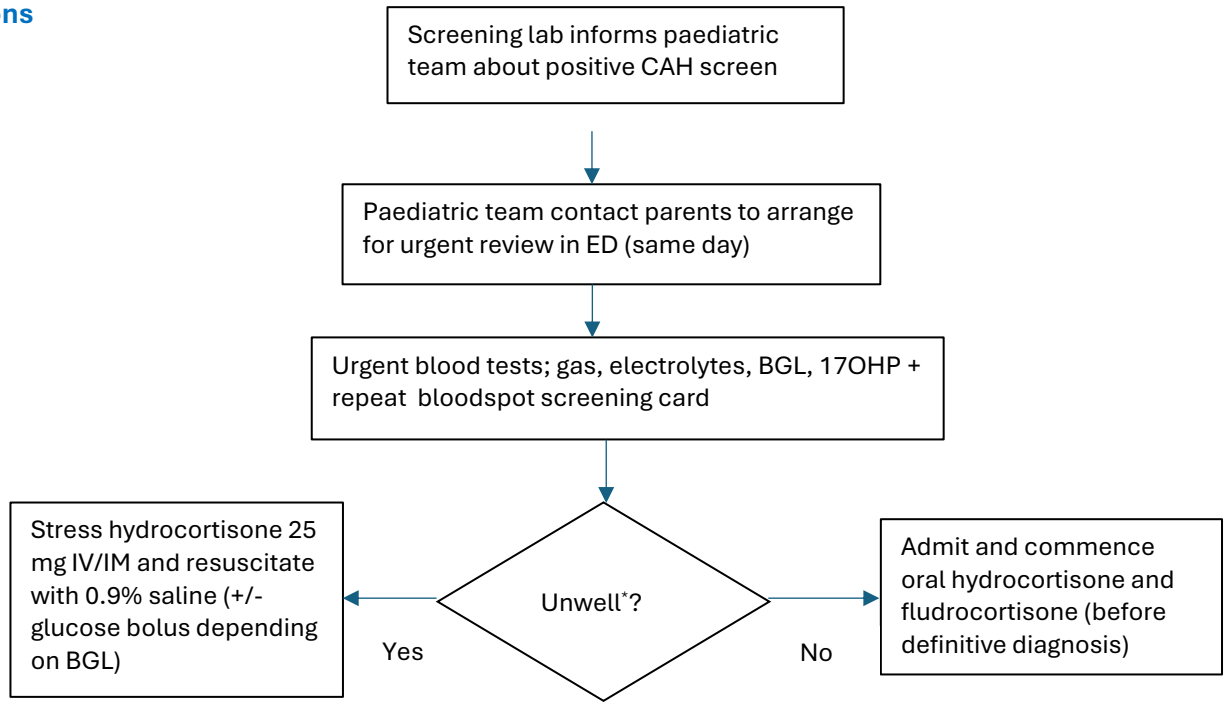
If well, treatment is with oral hydrocortisone and fludrocortisone.

If unwell, treatment is with IV hydrocortisone initially.

Previously well babies on hydrocortisone who deteriorate should receive stress steroid dosing.

All CAH screen-positive newborns should be admitted to hospital.

Actions



*unwell e.g. hypotension, hypoglycaemia, hyponatraemia, hyperkalaemia

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Background:

- False positive CAH screening tests are rare in term infants.
- Screen positive babies are at high risk of deterioration from days 5-7 of life or beyond if treatment is delayed while further confirmatory biochemical or genetic tests are awaited
- New Zealand practice based on 40 years' experience of screening is to start hydrocortisone early in **all** babies recalled with a positive CAH screen, i.e. while definitive diagnostic results are pending and often before hyponatraemia/hyperkalaemia has developed. Most remain in hospital until feeding is established and after a minimum of 48 hours of oral therapy and stable electrolytes.

Recall of screen-positive babies:

- Following the screen notification, the local paediatric team should telephone the family to assess for symptoms (such as vomiting, poor feeding, lethargy) and arrange for urgent review within 12 hours at the latest.
- Parents of unwell infants should be asked to present to their local hospital emergency department immediately.

Assessment:

- History and examination includes assessment of vomiting, poor feeding, poor weight gain, lethargy, hydration, blood pressure, virilisation and excess pigmentation (genitalia, nipples), noting that these signs are not always present.
- Caution re: screen positive apparent "males" where no testes can be palpated, as such infants may in fact be highly virilised females.
- Initial biochemical assessment includes urgent gas, electrolytes (sodium, potassium), glucose, 17OHP.
- Note that many diagnostic laboratories cannot offer 17OHP results within a rapid time-frame. A second bloodspot card sent to the screening lab can provide a quick confirmation of identity. Do not delay treatment awaiting this result.
- Renin and aldosterone levels are difficult to interpret and of limited utility in the first weeks of life due to physiological mineralocorticoid resistance and wide normal ranges. If performed, interpretation should be made with caution.

Initial management:

- **Unwell babies** should receive a stress dose of hydrocortisone (25 mg IV/IM) and resuscitation with 0.9% saline. If BGL <3 mmol/l, give 10% dextrose bolus (2 mls/kg). Hydrocortisone is continued as 100 mg/m^2/d or 1 mg/kg IV/IM 4 hourly. Additional fludrocortisone is not needed alongside stress glucocorticoids as large doses have mineralocorticoid effect.
- For **well babies** with probable CAH, commence hydrocortisone 12-15 mg/m^2/d (i.e. 1-1.5 mg po tds), and fludrocortisone 100-200 mcg po once daily.
- Salt replacement is started once feeding is established and prior to discharge home (typically 4 mmol/kg/d in 4 divided doses). You can make a 2mmol/ml solution by dissolving 1 teaspoon NaCl per 50mls water; typical dosing of this solution is 0.5 ml/kg 4 times a day.
- Affected infants can be successfully assessed and managed close to home in regional hospitals, supported by early and on-going advice from a paediatric endocrinologist. The key is early initiation of oral therapy.
- **All babies** with suspected CAH should be discussed with the local paediatric endocrine team.

Ongoing management:

- Babies with CAH need careful on-going review, including booked review with a paediatric endocrinologist at 4-6 weeks of age.
- In the newborn period, some clinicians exceed recommended glucocorticoid doses in order to reduce elevated androgen levels as quickly as possible. If this treatment strategy is adopted, early monitoring is necessary to rapidly reduce the dose when target levels of monitored steroids are achieved, to avoid adverse effects of high doses of glucocorticoids.
- Genetic testing is generally not needed to confirm a screen-detected case of CAH but may have additional utility for genetic counselling.
- The screening lab should be advised of the outcome of the screening notification (i.e. by completion of the screening outcome form).

Clinical suspicion of CAH

All babies with suspected CAH should be discussed with the local paediatric endocrine team. If CAH is clinically suspected prior to newborn screening (e.g. a virilised female infant) then an urgent 17OHP level and ideally an urgent steroid profile are warranted. Clinicians should contact the screening laboratory to discuss early bloodspot sample collection, transport and urgent analysis.

CAH screening in preterm babies

Adrenal immaturity means that false positive screens i.e. elevations in 17OHP measurement by immunoassay are more common in preterm babies, despite modified decision limits. Positive or borderline screen results are typically notified to the treating team (i.e. NICU), with advice to check electrolytes, a gas and collect a repeat screening sample closer to term. False negative screen results because of persistence of the foetal adrenal zone and/or medication (e.g. steroids or fluconazole) are a further consideration.

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