SUDDEN UNEXPECTED POSTNATAL COLLAPSE IN FIRST WEEK OF LIFE

Sudden unexpected postnatal collapse (SUPC) in apparently well term babies, in the first week of life is rare

Summary of BAPM SUPC recommendations

- Increased risk of congenital anomaly or metabolic disease
- Need comprehensive investigation to determine underlying cause
- Involve interdisciplinary liaison to maximise diagnostic yield
- Senior doctor to obtain detailed family history and situational events
- Notify coroner of all babies who die from such collapse
- For all babies who die, post-mortem to be performed by a perinatal pathologist
- If collapse happened after baby left hospital safeguarding issues must be considered
- Detailed multiprofessional case review should follow investigation of unexpected baby death

Information after the event

Collect the following as soon as possible after presentation

Parental medical history

- Full parental drug, alcohol and nicotine history
- 3-generation family tree noting egg donation, sperm donation (where available)

Obstetric history (from consultant obstetrician or senior trainee)

- Infection
- Fetal growth
- Suspected fetal anomalies
- Fetal movements
- Liquor volume

Labour and birth (from consultant obstetrician or senior trainee)

- Maternal medication
- Markers of fetal wellbeing
  - scalp pH
  - cord pH
  - electronic fetal monitoring
  - passage of meconium
  - requirement for resuscitation

Health of baby until collapse

- Growth and feeding

Other information

- Circumstances surrounding collapse
  - who was present?
  - was baby feeding?
  - position of baby (from staff and family present at time of collapse)
- It is also important to collect information from other agencies who may have been involved with the family e.g. primary care, social care and police
- Full resuscitation details

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Investigations whilst baby alive

- Carry out a full examination
- Liaison with local and regional laboratories is mandatory to ensure optimal collection and timing of samples. Use your judgment about which tests to prioritise to ensure optimal diagnostic yield with least intervention
- If baby sufficiently stable, consider transfer to a specialist unit for imaging

Neonatal blood	Cerebrospinal fluid	Surface swabs	Nasophyngeal aspirate	Urine	Imaging	Other investigations
• FBC • Coagulation • Blood gas • Renal and liver biochemistry • Glucose • Lactate • Calcium • Magnesium • Ammonia • Beta-hydroxybutyrate • Amino acids • Insulin • Free fatty acids • Acylcarnitines profile • Urates • Uric acid • Cortisol (3 samples at different times) • Culture • Viral titres • Bloodspot for cardiolipin analysis • Specific genetics: ◦ DNA ◦ chromosomes ◦ microarray ◦ retained bloodspot	• Biochemistry • Glucose (paired with plasma glucose) • Culture • Virology • Lactate • Amino acids including glycine, storage	• Bacteriology	• Bacteriology and virology	• Bacteriology • Virology • Toxicology • Organic acids including orotic acid • Amino acids including urinary sulphocysteine • Retain urine for storage	• Skeletal survey • Cranial ultrasound scan • MRI brain scan • Renal/adrenal ultrasound scan • Electrocardiogram • Echocardiogram	• Ophthalmoscopy/ Retcam • Skin biopsy for fibroblast culture • If unable to exclude neuromuscular or mitochondrial disorder, muscle biopsy • Electro-encephalogram • Genetics assessment and clinical photographs

- If there is suspicion that the event may have been due to unrecognised hypoventilation/apnoea, send DNA sample for phox2b gene abnormalities (commonly implicated in congenital central hypoventilation syndrome)
- Consider testing for mutations and copy number variation in mecp2 gene. This may present as newborn encephalopathy and/or apnoeas and respiratory collapse
- Array-based comparative genomic hybridisation is a useful investigation (will replace conventional karyotyping for detecting causative chromosomal deletions and duplications)

Investigations before post-mortem

- If it has not been possible to take samples during life, take samples (where feasible) while awaiting post-mortem to prevent degradation of material and loss of important diagnostic information. Where possible, discuss and agree baseline samples with a pathologist and, where indicated, a biochemist
- if difficulty obtaining necessary kit for investigations, most labour wards have a 'stillbirth kit' which will contain much, if not all, of what is needed. Discuss with laboratory before beginning procedure if a full kit cannot be collected
- Throat and nose swabs for bacterial and viral culture
- Blood culture
- Blood and urine for metabolic studies
- glucose, acylcarnitine, organic and amino acids including orotic acid and sulphocysteine, freeze urine for storage
- Blood for DNA, chromosomes and dried bloodspots on several cards
- CSF obtained by lumbar puncture or ventricular tap – biochemistry
- glucose
- culture
- virology
- lactate
- amino acids including glycine, freeze and store
- Skin biopsy (if possible locally) for culture and storage of fibroblasts: 3 × 2 mm full thickness using aseptic technique into culture or viral transport medium or gauze soaked in sodium chloride 0.9%. Send promptly to cytogenetics laboratory (see **Skin biopsy** guideline)
- Muscle biopsy (if possible locally) for electron microscopy, histopathology and enzymology. Wrap in aluminium foil, snap freeze and store at −70°C. Contact metabolic physician or pathologist before sample collection

Safeguarding issues

- Must be considered in all cases of out of hospital collapse
- The process of investigation for unexpected child deaths sometimes needs following even if baby survives
- Involves the rapid response team from the district who need to undertake a home visit to gather additional information regarding the critical event

For documentation and investigation check list for SUPC, use appendices from full BAPM guidelines – www.bapm.org/sites/default/files/files/SUPC_Booklet.pdf