**Concurrent Noonan Syndrome and Sanjad–Sakati Syndrome in a Newborn: First Genetically Confirmed Dual Diagnosis**

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## ***Supplementary Information***

**TABLES:**

**Supplementary Table S1.** Newborn screening results

| **Test** | **Values** |
|---|---|
| TSH | 83.9 µU/ml |
| Ammonia | 332 |
| Lactate | 14 |
| Leucine/ Isoleucine | 287 (high) |
| Valine | 239 (high) |
| Methionine | 57 (high) |
| Phenylalanine | 147 (high) |
| Phen/Tyr ratio | normal |
| Acylcarnitine | normal |

**Supplementary Table S2.** Repeated metabolic investigations

| **Test** | **Results** |
|---|---|
| Ammonia | 49.4 |
| Lactate | Normal |
| Plasma amino acids | Normal |
| Urine organic acid | Normal |

**Supplementary Table S3:** Plasma amino acid chromatography

| Amino Acid | Result (µmol/L) | Newborn Reference (µmol/L) |
|---|---|---|
| Taurine | 132 | 75 – 220 |
| Aspartic Acid | ND | 20 – 110 |
| Hydroxyproline | 8 | TRACE |
| Threonine | 188 | 50 – 200 |
| Serine | 194 | 120 – 250 |
| Asparagine | 22 | 20 – 95 |
| Glutamic Acid | 114 | 110 – 340 |
| Glutamine | 554 | 250 – 750 |
| α-Amino Adipic Acid | ND | ND |
| Proline | 512 | 115 – 275 |
| Glycine | 188 | 150 – 450 |
| Citrulline | 25 | 10 – 45 |
| α-Aminobutyric Acid | 8 | 5 – 40 |
| Valine | 186 | 50 – 250 |
| Cystine | 24 | 15 – 40 |
| Methionine | 20 | 10 – 40 |
| Isoleucine | 14 | 25 – 50 |
| Leucine | 72 | 45 – 150 |
| Tyrosine | 36 | 40 – 100 |
| Phenylalanine | 66 | 40 – 110 |
| Homocysteine | 4.53 | 5 – 15 |
| Ornithine | 67 | 50 – 150 |
| Lysine | 168 | 115 – 270 |
| Histidine | 98 | 45 – 100 |
| 1-Methyl Histidine | - | – |
| Tryptophan | - | <70 |
| Arginine | 15 | 20 – 90 |

**Supplementary Table S4.** Initial complete blood count

| Test | Result | Unit |
|---|---|---|
| WBC (TLC) | 34.02 | $\times 10^3/\mu L$ |
| Hemoglobin | 9.7 | g/dL |
| Platelets | 61 | $\times 10^3/\mu L$ |

**Supplementary Table S5.** Peripheral blood smear findings

| Test | Finding |
|---|---|
| Peripheral Blood Smear | Mild microcytic normochromic anemia with anisocytosis<br>Leukocytosis with absolute lymphocytosis and monocytosis<br>No blasts or atypical cells |

**Supplementary Table S6.** Bone marrow aspirate findings

| Test | Result |
|---|---|
| Cellularity | Hypocellular for age |
| M:E Ratio | 3.9 : 1 |
| Megakaryocytes | Decreased |
| Myeloid series | Adequate, normal maturation |
| Erythroid series | Decreased, normal maturation |
| Aspiration | Difficult |
| Conclusion | Hypocellular marrow for age<br>Depressed trilineage hematopoiesis<br>Decreased megakaryopoiesis<br>No evidence of leukemia<br>No evidence of marrow metastasis |

**Supplementary Table S7.** Renal function and serum and urine electrolyte results

| Test | Day 2 | Day 35 | Reference |
|---|---|---|---|
| Creatinine | 116 | 21 | 28-47 umol/L |

| | | | |
|---|---|---|---|
| Urea | 7.9 | 4.9 | 1.4-6.4 mmol/L |
| Na | 130 | 136 | 136-145 mmol/L |
| K | 5 | 4.3 | 3.5-5.8 mmol/L |
| Ca | 1.7 | 1.69 | 2.2-2.7 mmol/L |
| Phos | 1.4 | 2.5 | 1.55-2.7 mmol/L |
| Mg | 0.67 | 0.64 | 0.77-1.05 mmol/L |
| Urine Ca:Crt | | 0.123 (n) | |

**Supplementary Table S8.** Thyroid function and parathyroid hormone results

| **Test** | **Day 1 (NBS)** | **Day 2** | **Day 7** | **Unit** |
|---|---|---|---|---|
| TSH | 83.9 | 6.8 | 7.6 | µU/ml |
| T4 | - | 7.2 | 15.7 | µg/dL |
| PTH | - | - | 0.32 | pg/mL |

**Supplementary Table S9.** Cytogenetic and molecular genetic findings

| **Test** | **Result** |
|---|---|
| Karyotype | 46,XY (normal) |
| MLL rearrangement | Negative |
| CBFB inv(16)/t(16;16) | Negative |
| DNA panel | No clinically significant mutations |
| RNA panel | No rearrangements detected |

**Supplementary Table S10.** Flow cytometry (immunophenotyping)

| **Marker** | **Result** |
|---|---|
| CD13 | Positive |
| CD33 | Positive |
| CD34 | Positive |
| CD117 | Positive |
| HLA-DR | Positive |

| | |
|---|---|
| MPO | Positive |
| TdT | 8% |
| MPO | 55% |

**ABBREVIATIONS:**

Ca, calcium; Ca:Cr, calcium-to-creatinine ratio; CBFB, core-binding factor subunit beta; CD, cluster of differentiation; DNA, deoxyribonucleic acid; HLA-DR, human leukocyte antigen-DR; M:E, myeloid-to-erythroid; Mg, magnesium; MLL, mixed-lineage leukemia (KMT2A); MPO, myeloperoxidase; Na, sodium; NBS, newborn screening; ND, not detected; Phos, phosphate; PTH, parathyroid hormone; RNA, ribonucleic acid; T4, thyroxine; TdT, terminal deoxynucleotidyl transferase; TLC, total leukocyte count; TSH, thyroid-stimulating hormone; WBC, white blood cell.

**FIGURES:**

**Supplementary Fig. S1** Contrast upper gastrointestinal studies. **a** At 7 weeks of age showing normal opacification of the esophagus, stomach, proximal small bowel, rectum, and distal bowel loops, with no evidence of obstruction or fistula; **b** At 8 weeks of age demonstrating delayed gastric emptying.