

## **Diagnostic and prognostic values of miR181b-5p and miR21-5p for neonatal sepsis risk and their link to SNAP II score and disease mortality.**

### **Abstract:**

**Background:** Neonatal sepsis is a lethal syndrome that necessitates prompt treatment to avoid disease complications. As a result, biomarkers that may either differentiate sepsis early or predict the outcome of sepsis are essential.

**Aim:** The goal of this research was to find out the clinical weight of using miR181b-5p and miR21-5p expression levels as diagnostic and prognostic new genetic markers for neonatal sepsis.

**Method:** A total of 60 neonates with sepsis and 60 healthy neonates were involved in this study. Laboratory tests include complete blood count (CBC), random blood sugar (RBS), arterial blood gases (ABG), and serum C reactive protein (CRP). Neonates with sepsis were assessed by the Score for Neonatal Acute Physiology II (SNAPII). The serum fold changes of the target miRNAs were determined using qRT-PCR and the  $2^{-\Delta\Delta C_t}$  equation.

**Results:** The relative serum level of miR181b-5p was [ median (IQR) = 0.2509 (0.0009–4.11)] and for miR21-5p was [median (IQR) = 0.07 (0.007–7.16)] which were significantly downregulated in patients with neonatal sepsis compared to controls ( $p < 0.001$  each). There was a strong significant positive correlation between miR181b-5p and miR21-5p with  $r = 0.718$  and  $p < 0.001$ . MiR181b-5p and miR21-5p were significantly negatively correlated with total leucocytic count (TLC), lymphocytic count, and CRP. While they were both positively correlated to the SNAP II score. Obvious association between higher expressions of target genes and higher SNAPII score groups. After a following-up period, twenty-two (36.7%) neonates died, while 38 (63.3%) of the babies became better and were released from the hospital. We reported that miR-181-5p, miR21-5p, SNAP II score and CRP were significantly higher in non-survivors than survivors. Only miR181b-5p, miR21-5p, and SNAP II were predictive factors of septic mortality.

**Conclusion:** MiR181b-5p and miR21-5p are diagnostic and prognostic biomarkers of neonatal sepsis.