[3844.506] Thoracic Fluid Index Changes in Children Recovering with Pneumonia

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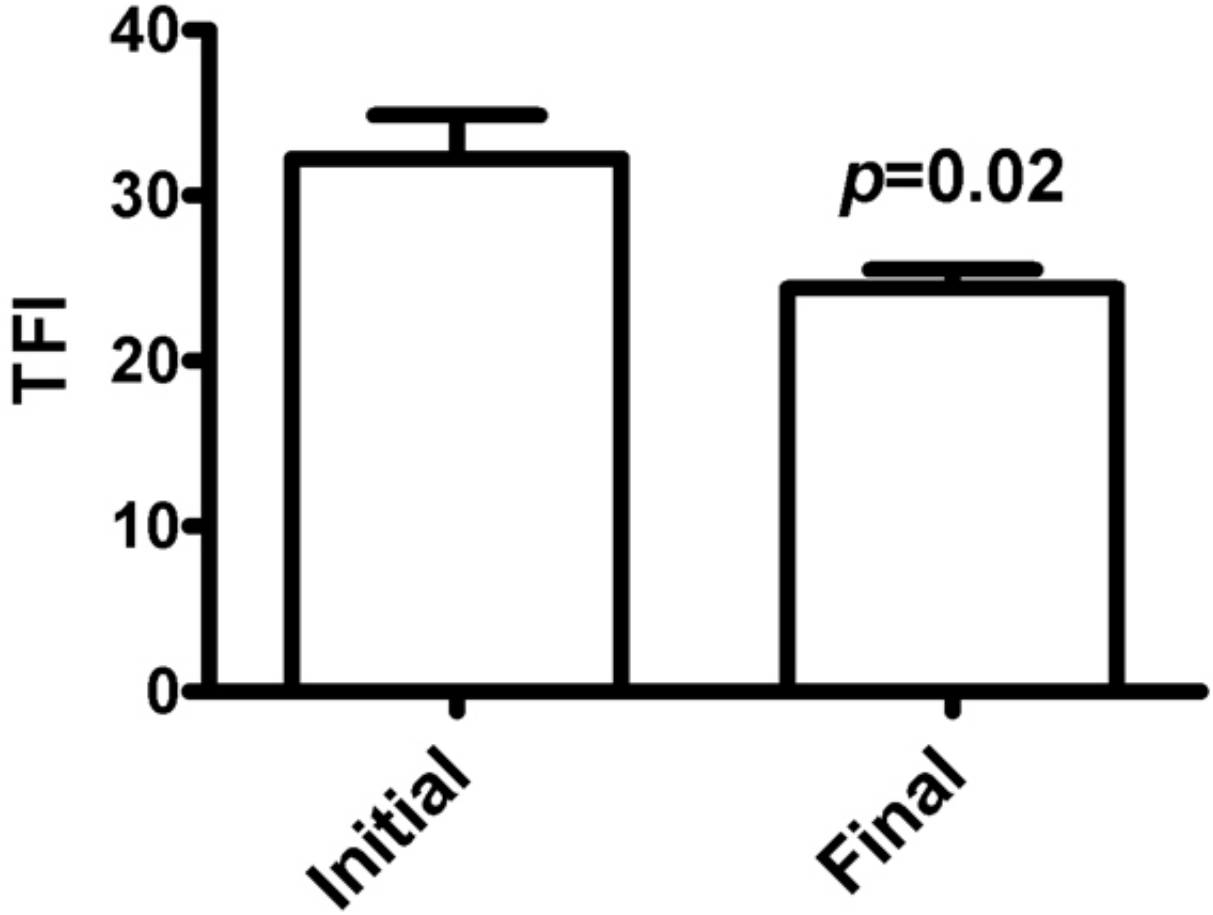
BACKGROUND: A decrease in extrapulmonary lung water index (ELWI) is associated with a decreased mortality in children with respiratory failure 1, however, the measurement of ELWI requires invasive catheters. In adults with cardiac failure, bioimpedance techniques can be used to assess pulmonary fluid status2. Electrical cardiometry (EC), a subtype of bioimpedance, provides a thoracic fluid index (TFI) along with cardiac index (CI).
OBJECTIVE: Our objective is to assess if there are changes in TFI in children recovering from pneumonia and how the change, if any, is related to changes in CI and respiratory rate (RR).
DESIGN/METHODS: This is a sub-analysis of children with pneumonia in an IRB approved study assessing CI changes during hospitalization. TFI, heart rate (HR), CI and SI were recorded with an EC monitor (Aesculon; Cardiotronic Inc, LaJolla CA) within 24 hours of admission (INITIAL) and discharge (FINAL). RR was obtained from the medical records. The INITIAL and FINAL measurements were compared with paired t test. The relationships of the changes in TFI (FINAL-INITIAL) to the corresponding changes in RR or CI were assessed by linear regression. Data is presented as Mean ± SEM with $p \leq 0.05$ = significant.
RESULTS: Fourteen children (9 male and 5 female; median age 5 years [0.6-12]; weight 22.5 kg [7.5-68] and length of stay 8.3 days [range 2-18]) had a diagnosis of pneumonia. There was a significant decrease in TFI from INITIAL to FINAL (32.2 ± 9.7 to 24.4 ± 4.2).



There was also a significant decrease in RR (32.5 ± 1.7 to 25.4 ± 1.4 breaths/min), HR (122 ± 23 to 100 ± 23 beats/min), CI (5.1 ± 1.7 to 3.66 ± 0.7 Liter/m2/min) whereas SI did not change (41.8 ± 10.3 to 37.1 ± 4.9 ml/m2/beat). There was no relationship between changes in TFI with changes in RR (p=0.7101) or CI (p=0.3498).
CONCLUSIONS: TFI decreased in children during recovery from pneumonia. The change in TFI was not related to changes in RR or CI. Direct comparisons of TFI to invasive ELWI measures are warranted.
1. Prognostic value of extravascular lung water index in critically ill children with acute respiratory failure.

Lubrano R et al, Intensive Care Med. 2011 Jan;37(1):124-31.
2. Vorwerk, C et al. Thoracic electrical bioimpedance: a tool to determine cardiac versus non-cardiac causes of acute dyspnoea in the emergency department. Journal Emergency Medicine. 2010 27: 359-363.
First Author is a Fellow in Training
E-PAS2012:3844.506

Session: Poster Session: Critical Care (4:15 PM - 7:30 PM)
Date/Time: Monday, April 30, 2012 - 4:15 PM
Room: Exhibit Halls A/B - Hynes Convention Center
Board: 506
Course Code: 3844

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