Role of Pentraxin 3 in Differentiating Invasive Aspergillosis (IA) from Aspergillus Colonization (Ac) in Lung Transplant Recipients

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Abstract (revised)

Background. Ac is a unique clinical syndrome in lung transplant recipients (LTRs). Surrogate markers may aid in differentiating colonization from invasive disease as diagnostic imaging may not be of assistance. The use of a pro-inflammatory biomarker may improve the accuracy of diagnosis. We hypothesized that PTX3 levels in the bronchoalveolar lavage (BAL) will be lower in LTRs with colonization as compared to those with IA.

Methods. BAL samples from LTRs from June 2010-May 2012 were analyzed for the quantification of PTX3 by sandwich enzyme linked immunosorbent assay (ELISA). IA was determined as per the ISHLT criteria. Statistical comparison was performed for PTX3 median values from BAL samples of LTRs with IA, Ac and from healthy controls.

Results. A total of 172 BAL samples from 76 LTRs and 9 controls were analyzed. Three cases of probable IA and 20 Ac were noted, while 140 episodes were characterized as negative for Aspergillosis infection/colonization. Median time to PTX3 sample from transplant was 269 days (93-383). Median values of PTX3 (25%–75% percentiles) were 1428.64 pg/ml (404–3302.3) in episodes of IA, 13.67 pg/ml (13.67–41.66) with Ac, and 13.67 pg/ml (13.67–137.54) in episodes of negative aspergillus GM/GM and 13.67 pg/ml (13.67–137.54) in healthy controls. PTX3 levels were significantly higher in patients with IA compared to Ac with a P value of 0.0019.

Conclusions. Our data suggest that measurement of surrogate pro-inflammatory markers such as PTX3 in BAL may assist in differentiating patients with Aspergillus colonization and IA. These findings have diagnostic and therapeutic implications and should be validated in a larger cohort.

References
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PTX3 levels in BAL of lung transplant recipients with colonization are significantly lower as compared to invasive disease. Measuring PTX3 in BAL might provide an additional tool that might help clinician differentiate between Aspergillis colonization and invasive disease, especially early in the disease when radiological findings are subtle.

Data needs to be validated by a larger cohort.

Figure 1: Receiver operating characteristic (ROC) curves illustrating differences in performance of BAL PTX3 for the diagnosis of IA: Invasive Aspergillosis, AspTB: Aspergillus Trachecobronchitis and AspCol: Aspergillus Colonization

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