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EXTRACELLULAR VESICLES CHANGE IN SIZE AND CONCENTRATION IN BREAST MILK FROM MOTHERS WITH ASTHMA

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Background:

Asthma is one of the most common chronic health conditions in children. While breastfeeding is generally protective against asthma, evidence is mixed. It is likely that components of breast milk (BM) play a role in asthma development. One understudied BM component are extracellular vesicles (EVs). EVs are membrane-bound nanostructures released from all cells. EVs package biochemical content from the parent cell and deliver it to the recipient cell. EVs, through specific cargo such as miRNA species, are involved in potentiating early development of asthma in environmental exposure-based studies. It follows that the EVs in breast milk from mothers with asthma are likely candidates for promoting asthma development.

Objective:

The aim of this study was to isolate and characterize the EVs from BM of mothers with and without asthma.

Methods:

Whole BM from mothers with and without asthma (N=5 each) was obtained from our collaborator, Dr. Meghan Azad's lab, processed, and EVs isolated using size exclusion chromatography columns from Izon® Science. EV size, concentration, and zeta potential (stability), was measured using Tunable Resistive Pulse Sensing technology in a single-blind fashion. Data was analyzed using a Student's unpaired t-test, with $p < 0.05$ considered as significant.

Results:

BM samples were obtained from Caucasian subjects, between 25-36 years old, with or without a history of asthma. BMI and food allergy were controlled between subjects. EVs from BM of mothers with asthma had smaller size ($p=0.06$) and nearly 7-fold higher EV concentration ($p < 0.05$). Both groups had equally stable EVs as per zeta potential analysis.

Conclusion:

Our preliminary data suggest that EVs from BM of mothers with asthma are altered in content and size. EVs carry important biochemical message, which could be responsible for the child's

immunological sensitization and susceptibility to asthma. Further experiments to identify the differences in the content of these EVs are needed.