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## Introduction

Nonsteroidal Anti- Inflammatory medications have been found to cause “Pseudoallergic reactions” in which symptoms mimic an IgE mediated allergic reaction. The common symptoms are bronchospasm, urticaria, rhinoconjunctivitis and occasionally anaphylaxis. The symptoms occur within minutes to hours after the medication is taken. Pseudoallergic reactions differ from IgE mediated reactions in that they can occur on the first dose without any previous sensitization. Pseudoallergic reactions occur as a direct result of the pharmacological action of the medication and are dose dependent.

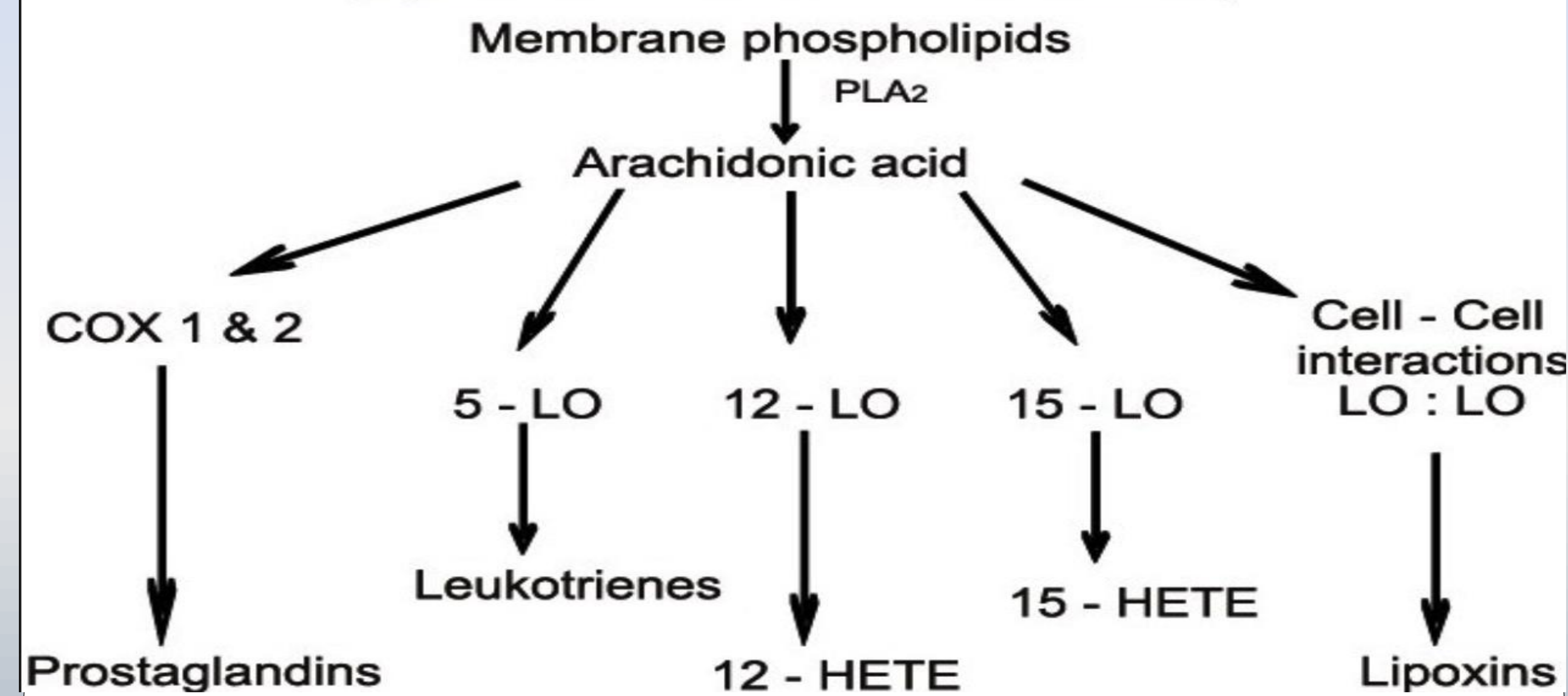
## Case Presentation

A 5 year old African American male with no past medical history presents with repeated episodes of facial angioedema that started 4 weeks prior. The mother reports the episodes occur with swollen lips, and swollen eyes and lasted roughly 12-48 hours on average. She denies any tongue swelling, or airway obstruction. She usually treats these episodes with OTC Benadryl with no relief. The mother has taken her son to the ED and urgent care with treatment consisting of steroids and an antihistamine. She denies any family history of angioedema. While being examined in the office, the patient develops sudden lip swelling. The child denies any itchy skin, urticaria during episodes, rash or abdomen pain.

## Lab Results

	Value	Reference Range
Total IgE	40 mg/dL	16-48 mg/dL

### Lipid Mediators of Inflammation



	Value	Reference Range
IgE Egg White	< 0.1 KUA/L	< 0.1 KUA/L
IgE Milk	< 0.1 KUA/L	< 0.1 KUA/L
IgE Peanut	< 0.1 KUA/L	< 0.1 KUA/L
IgE Codfish	< 0.1 KUA/L	< 0.1 KUA/L
IgE Soy	< 0.1 KUA/L	< 0.1 KUA/L

## Case

C4 and C1 esterase inhibitor levels returned normal values. Total IgE returned at 40 and serum specific IgE failed to return any positive values. The mother reports the patient had 3 similar episodes of angioedema after the initial visit. She reports no episodes for the last 2 weeks however. The mother reports the pediatrician started 5 mg of Montelukast daily and since then the child has not had any episodes. A further history was taken and the mother stated that the child is taking Children’s Motrin daily for musculoskeletal pain. After angioedema had occurred the mother would give more Ibuprofen as she believed it would decrease the swelling. She reports that within an hour of giving it, the patient would have nasal congestion and watery eyes which usually subsided in 1-2 hours. After further evaluation of the patient’s response to other NSAIDs, the child was diagnosed with a Pseudoallergy to NSAIDs with high likelihood of developing AERD. They were instructed to avoid all NSAIDs and continue Montelukast.

## Discussion

The precise mechanism of Pseudoallergic reactions has not been established however it likely involves inhibition of the Cyclooxygenase enzyme. COX-1 is expressed by most cells, and results in the production of prostanoids. COX-2 responsible for the generation of prostanoids important for inflammation. Cyclooxygenase inhibition causes a shift in the arachidonic acid metabolism toward the 5-lipoxygenase pathway and increased production of leukotrienes. Ibuprofen is a non -selective Cyclooxygenase inhibitor affecting both COX-1 and COX-2. The patient’s mother in the initial visit did not state that the patient was taking Ibuprofen when asked about the child’s medications. After the patient began taking Montelukast and the symptoms improved, the clinician asked specifically about Aspirin or NSAID use which the mother stated she gave daily Ibuprofen to the patient. The significant improvement with the Montelukast as a Leukotriene receptor antagonist provided the clue of the Pseudoallergy diagnosis.

## References

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- Stevenson DD, Sanchez-Borges M, Szczeklik A. Classification of allergic and pseudoallergic reactions to drugs that inhibit cyclooxygenase enzymes. Ann Allergy Asthma Immunol. 2001;87:177-180.
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