



Expression of Serum Periostin and impaired Quality of Life in Asthma Patients with and without Allergic Rhinosinusitis

Somruetai Matupumanon, M.D.¹

Advisor

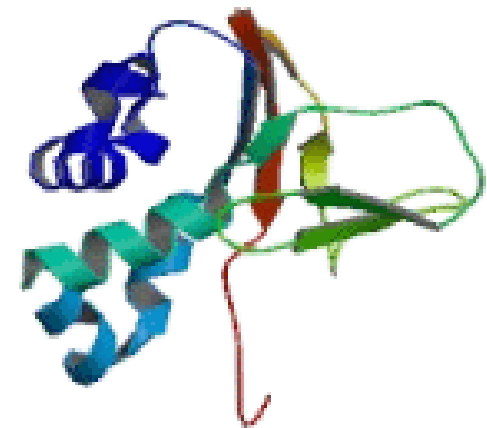
Theerasuk Kawamatawong, M.D., FCCP¹, Putthapoom Lumjiaktase, Ph.D.²

Division of Pulmonary and Critical Care Medicine¹, Department of Pathology²

Ramathibodi Hospital, Mahidol University^{1,2}

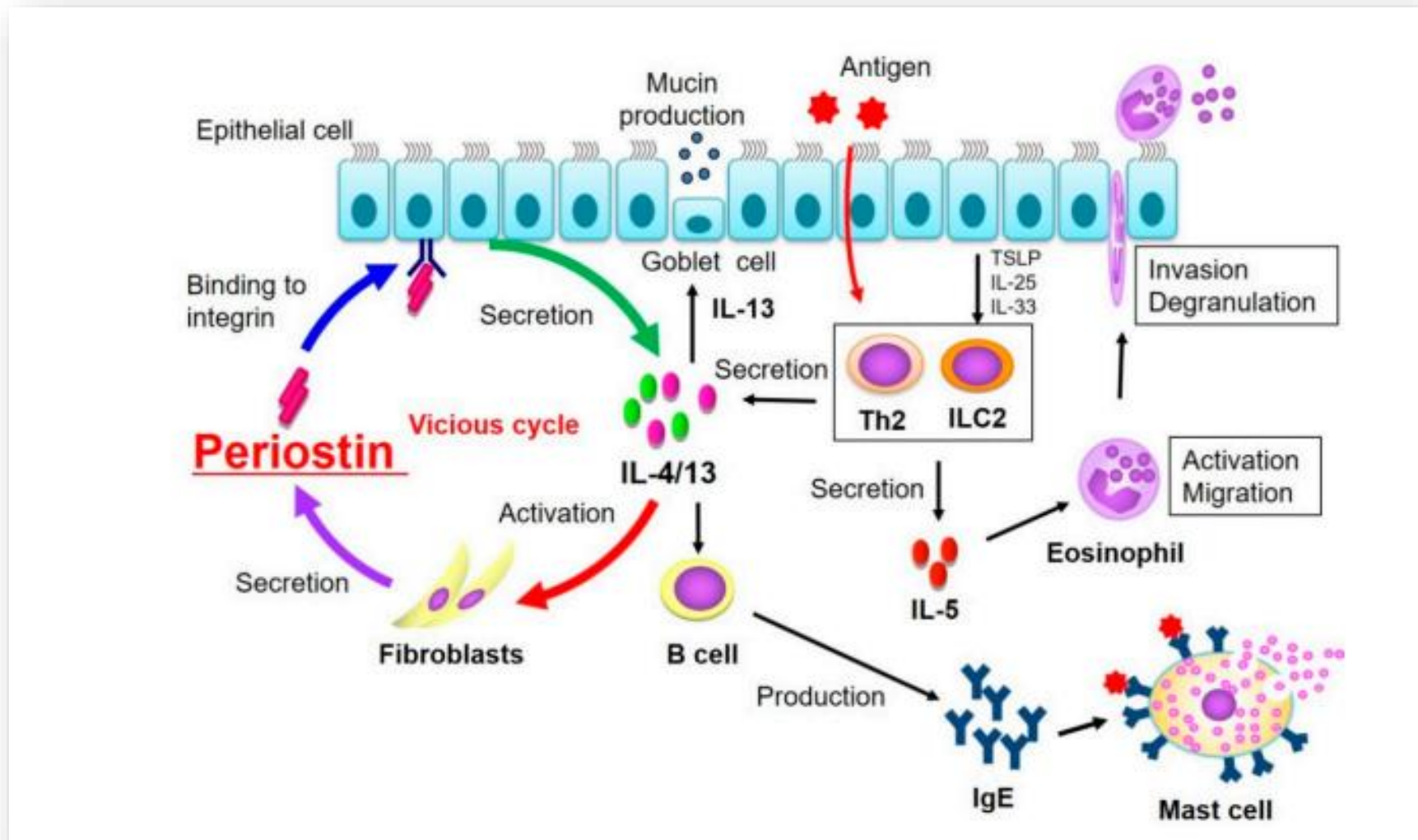
Periostin osteoblast specific factor-2 (OSF-2) Marker of T2 inflammation

- Periostin is a disulfide linked 90-kDa heparin-binding N terminus-glycosylated protein
- Periostin was originally identified as an 811-amino acid protein secreted by murine osteoblasts or osteoblast specific factor-2 (OSF-2).
- Classified as a matrix cellular protein
- Located on chromosome 13
- Upregulated by **IL-13 cytokines**



Serum Periostin (POSTN)
Osteoblast-specific factor OSF-2

Type 2 inflammation response related to periostin in pathogenesis of allergic disease



Serum periostin expression in various organs and diseases



Ear:
Eosinophilic otitis media

Esophagus:
Eosinophilic esophagitis

Serum periostin

Upper and lower airway:

- Chronic rhinosinusitis with nasal polyp
- Allergic rhinitis
- Asthma
- Asthma with CRS
- Asthma with COPD overlaps
- Obstructive sleep apnea-hyponea syndrome
- Pulmonary tuberculosis
- ABPA

Liver:

- Non-alcoholic fatty liver disease
- HCC
- Cholangiocarcinoma

Lung:

- Idiopathic interstitial pneumonia
- NSCLC

Skin:

- Atopic dermatitis
- Systemic sclerosis

Research question



Is there any increased of serum periostin level in asthma patients with allergic rhinosinusitis compared with asthma patients without allergic rhinosinusitis?

Objectives



Primary objective

- To determine the serum periostin level measured by ELISA in Thai asthma patients with and without allergic rhinosinusitis

Secondary objectives

- To determine the correlation between serum periostin and level of asthma control determined by asthma control test (ACT) score
- To determine the correlation between serum periostin and asthma-related quality of life determined by mini-asthma related quality of life questionnaire (mini-AQLQ)



Study design

Prospective study in adult Thai asthma patients diagnosis and treated in asthma clinic, Ramathibodi Hospital, Mahidol University

Study population

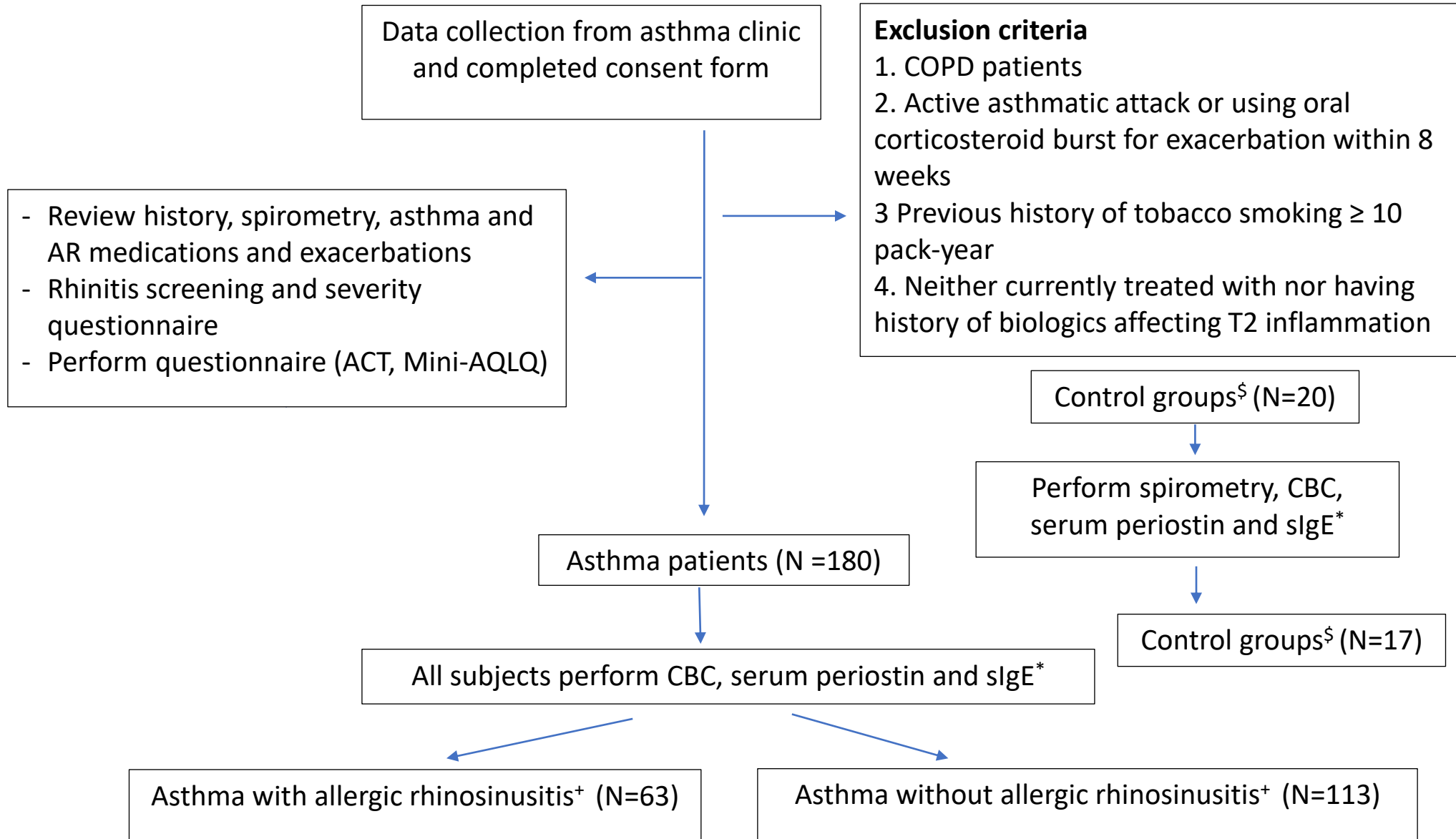
Inclusion criteria:

1. Definite diagnosis of asthma treated in Ramathibodi asthma clinic between February 2022 - October 2022
2. Age \geq 18 years old
- 3 Completed inform consent

Exclusion criteria:

1. COPD patients
2. Active asthmatic attack or using oral corticosteroid burst for exacerbation within 8 weeks
- 3 Previous history of tobacco smoking \geq 10 pack-year
4. Currently treated with and previously having history of biologics affecting T2 inflammation

Protocol Flow Chart

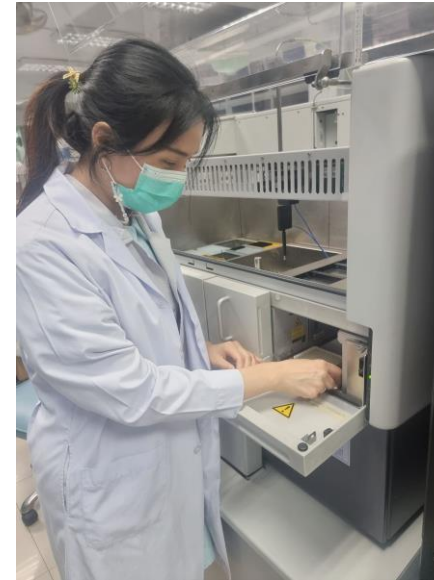
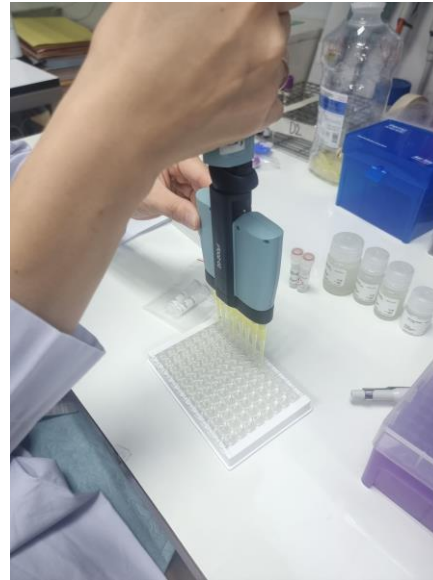
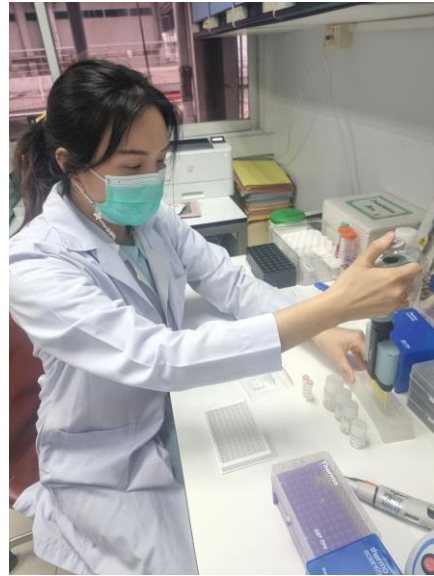
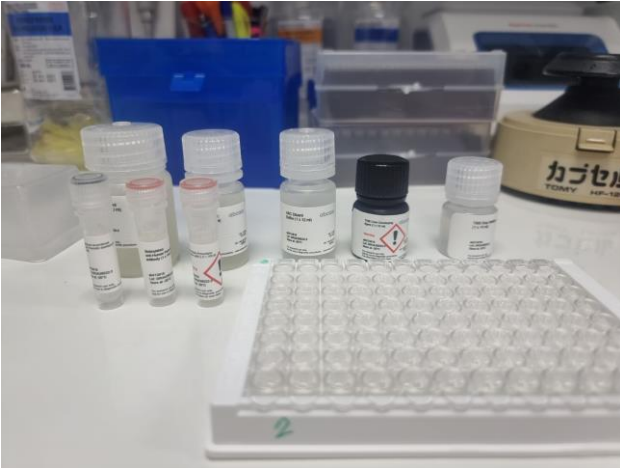


AR: allergic rhinosinusitis

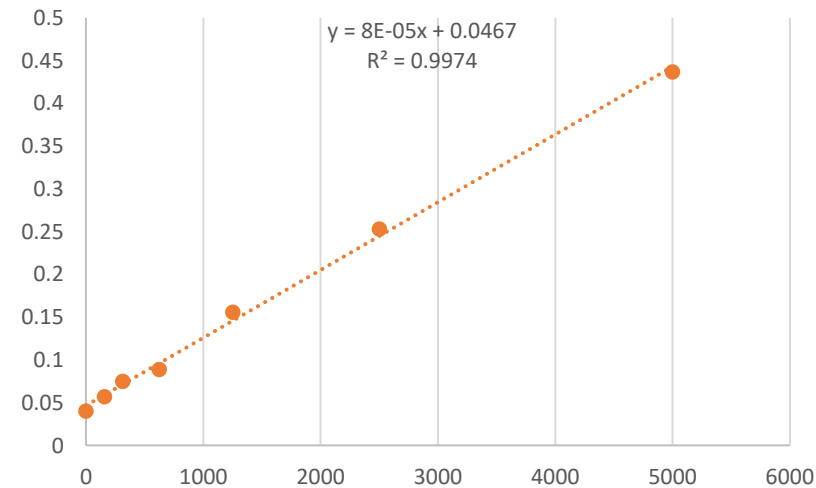
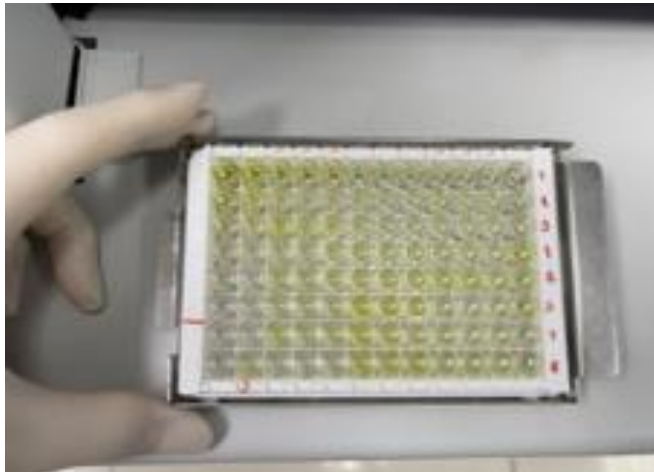
Allergic rhinosinusitis⁺: defined by clinician diagnosis or rhinitis symptom together with positive to sIgE*

Control groups[§]: non-asthma, normal spirometry, non smoking, no AR symptom

sIgE*: Specific IgE to Phadiatop (grass, tree & weed, pollen, edidermals, molds, mites & cockroaches)



Periostin test – ELISA technique



Periostin standard curve

ELISA technique will be used for detecting serum periostin in *duplicate manners* (2 repeated tests for sample of individual subjects)

Result

Table 1
Characteristics of the study group

Characteristic	Asthma with allergic rhinosinusitis (N=63)	Asthma without allergic rhinosinusitis (N=113)	Healthy (N=17)	P-value
Demographic and clinical observations				
- Age ⁺ (years)	53.57 ± 17.36	62.68 ± 15.37	37.05 ± 8.49	<0.001
- Male ⁺ (%)	17 (27%)	21 (17.9%)	6 (30%)	0.249
- Body mass index ⁺ , kg/m ²	25.09 ± 5.06	25.51 ± 5.16	24.36 ± 4.12	0.606
- OSA, n (%)	4 (6.3%)	11 (9.4%)	0 (0%)	<0.001
- Chronic rhinosinusitis with nasal polyp, n (%)	4 (6.3%)	11 (9.4%)	0 (0%)	0.309
- Obesity, n (%)	29 (46%)	61 (52.1%)	2 (10%)	<0.001
- GERD, n (%)	8 (12.7%)	9 (7.7%)	0 (0%)	<0.001
Asthma clinical control				
- asthma control test (ACT) score ⁺	20.49 ± 4.15	19.71 ± 4.66	25 ± 0	<0.001
Quality of life				
- Mini-asthma related quality of life questionnaire ⁺ (mini-AQLQ)	5.6 ± 1.03	5.51 ± 1.18	7 ± 0	<0.001
Pulmonary function test				
- Post BD FVC, % predicted ⁺	87.83 ± 19.08	83.88 ± 16.39	102 ± 9.55	0.024
- Post BD FEV ₁ , % predicted ⁺	81.46 ± 14.93	77.88 ± 17.05	100.67 ± 11.55	0.003
- Post BD FEV ₁ /FVC ratio ⁺	0.73 ± 0.11	0.73 ± 0.1	0.82 ± 0.06	0.167
Laboratory measurement				
- Blood eosinophils (cell/mm ³)*	250 (140, 370)	230 (120, 350)	130 (90, 180)	0.007
- Positive specific IgE [#] (>0.35 IU/ml), n (%)	63 (100%)	15 (12.8%)	5 (25%)	<0.001

Specific IgE[#] to Phadiatop

⁺ Mean ± SD

* Median (IQR)

Table 2

Current asthma and allergic rhinosinusitis medications



Medications	Asthma with allergic rhinosinusitis (N=63)	Asthma without allergic rhinosinusitis (N=113)	P-value
Asthma medications			
- ICS/LABA, n (%)	60 (95.2%)	112 (95.7%)	<0.001
- LAMA, n (%)	8 (12.7%)	21 (17.9%)	0.106
- SABA, n (%)	15 (23.8%)	34 (29.1%)	0.024
- Anticholinergic + SABA, n (%)	20 (31.7%)	31 (26.5%)	0.02
- Montelukast, n (%)	24 (38.1%)	56 (47.9%)	<0.001
- Xantine derivative, n (%)	1 (1.6%)	1 (0.9%)	0.805
Allergic rhinosinusitis medications			
- Intranasal steroid, n (%)	31 (49.2%)	48 (41%)	0.001
- Antihistamine, n (%)	27 (42.9%)	47 (40.2%)	0.002

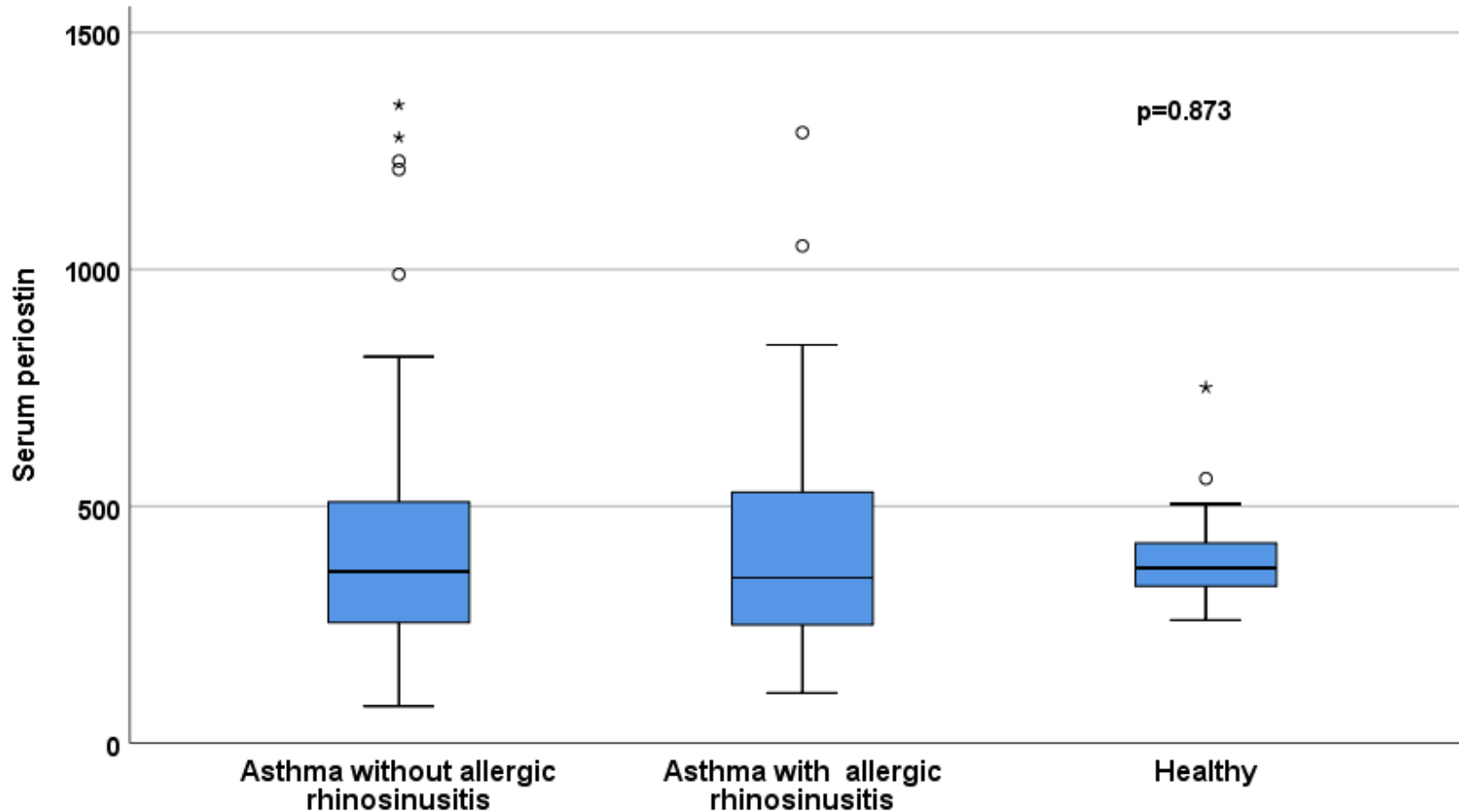
ICS: Inhaled corticosteroid

LABA: Long-acting beta agonist

LAMA: Long-acting muscarinic antagonists

SABA: Short acting beta agonist

Figure 1 Comparison of serum periostin with and without allergic rhinosinusitis



Allergic rhinosinusitis is defined by clinician diagnosis or rhinitis symptom together with the present of allergen sensitization determined by serum specific IgE positive

	Group								
	Asthma without allergic rhinosinusitis			Asthma with allergic rhinosinusitis			Healthy		
	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75
Serum periostin	362.13	253.92	510.88	348.92	247.25	530.88	369.63	331.42	422.13

Figure 2 correlation between serum periostin and level of asthma control determined by asthma control test (ACT)

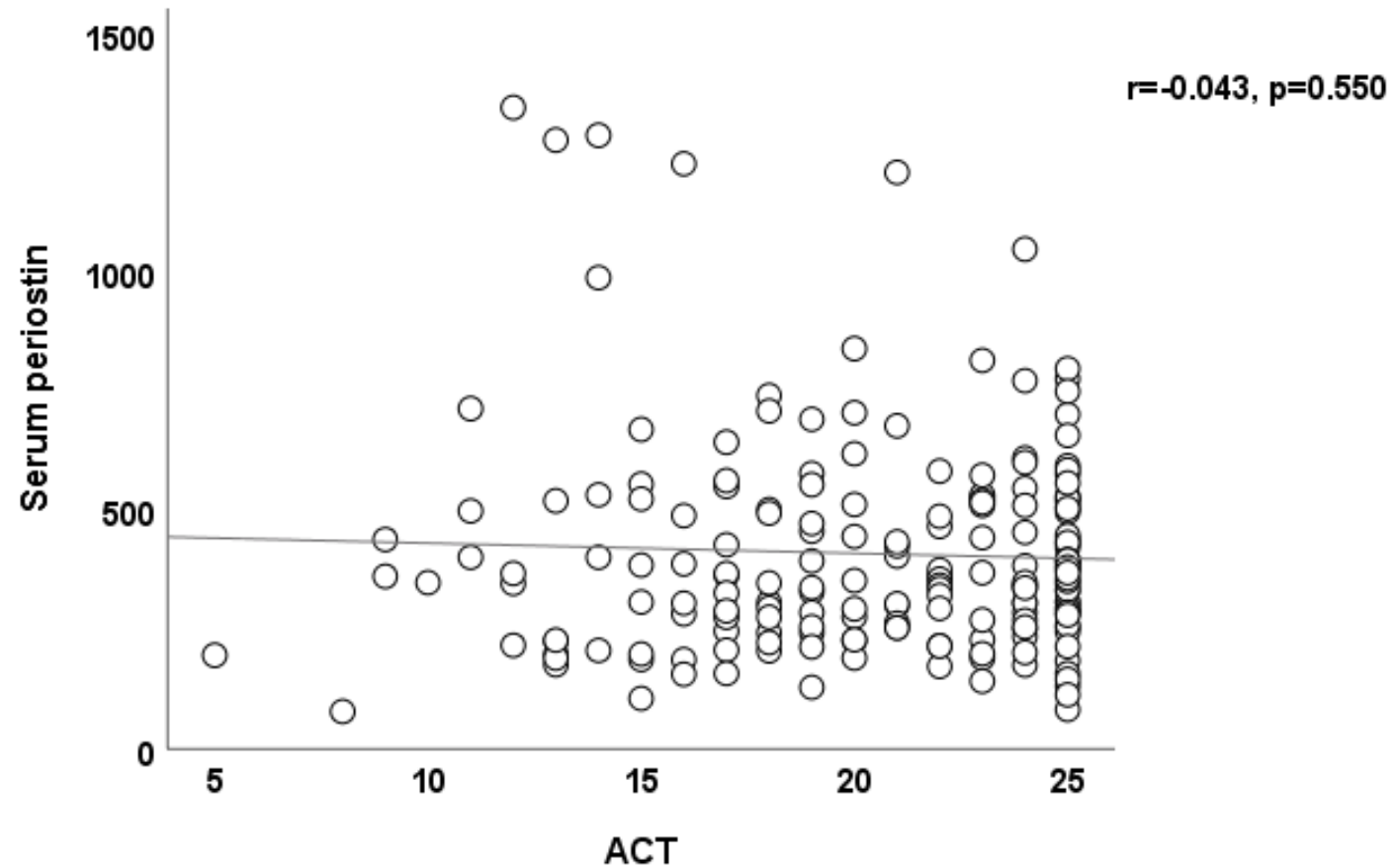


Figure 3 correlation between serum periostin and asthma-related quality of life determined by mini-AQLQ

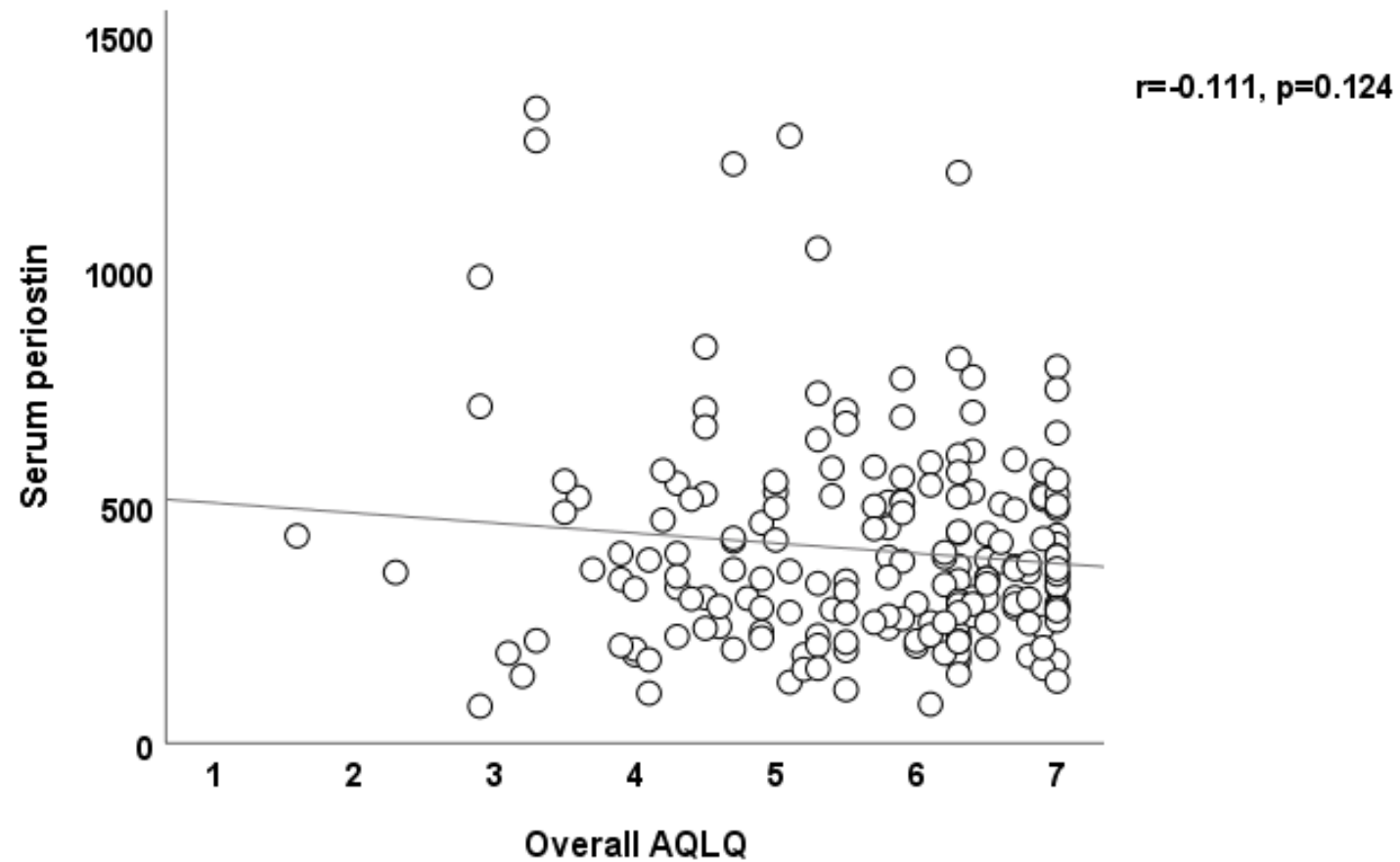


Figure 4 correlation between serum periostin and asthma-related quality of life determined by mini-AQLQ

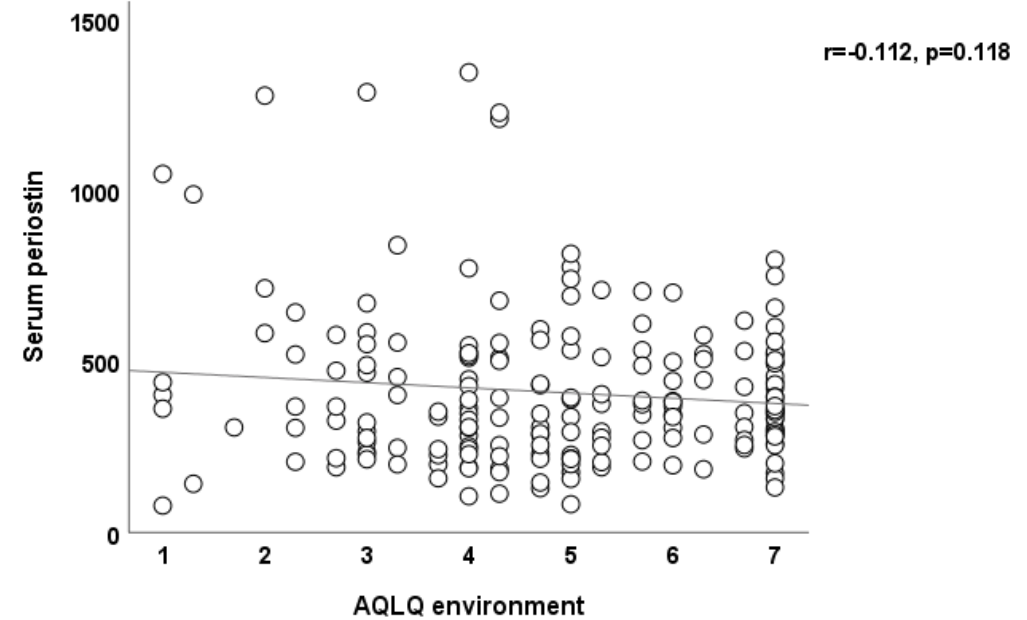
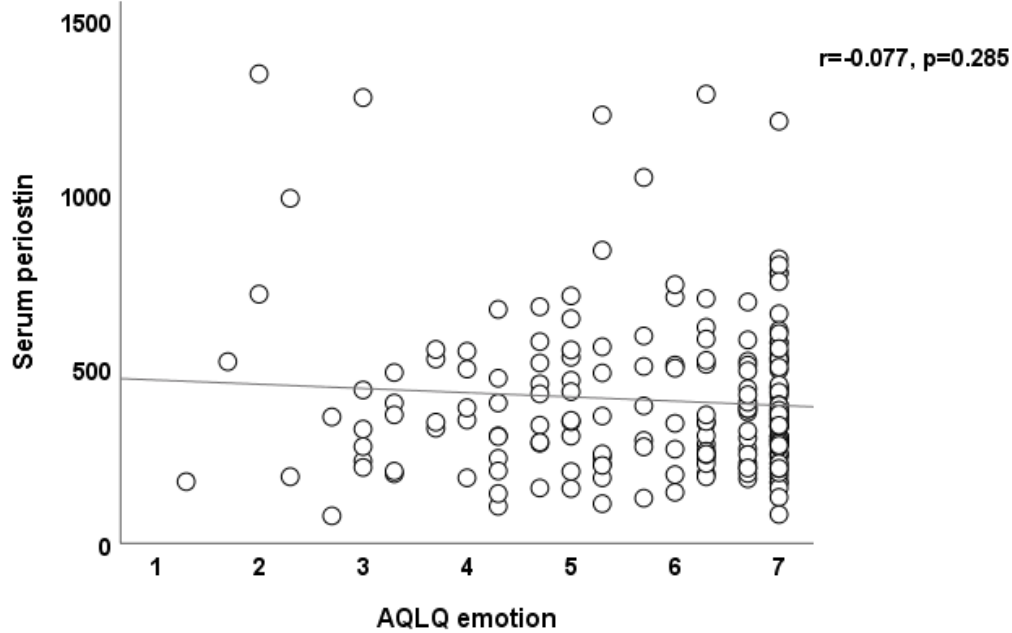
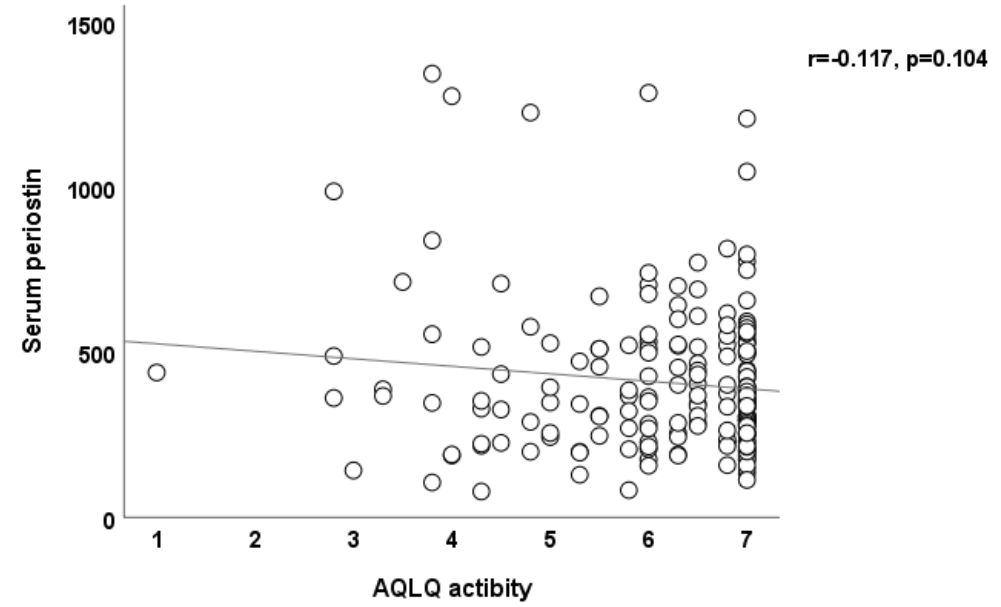
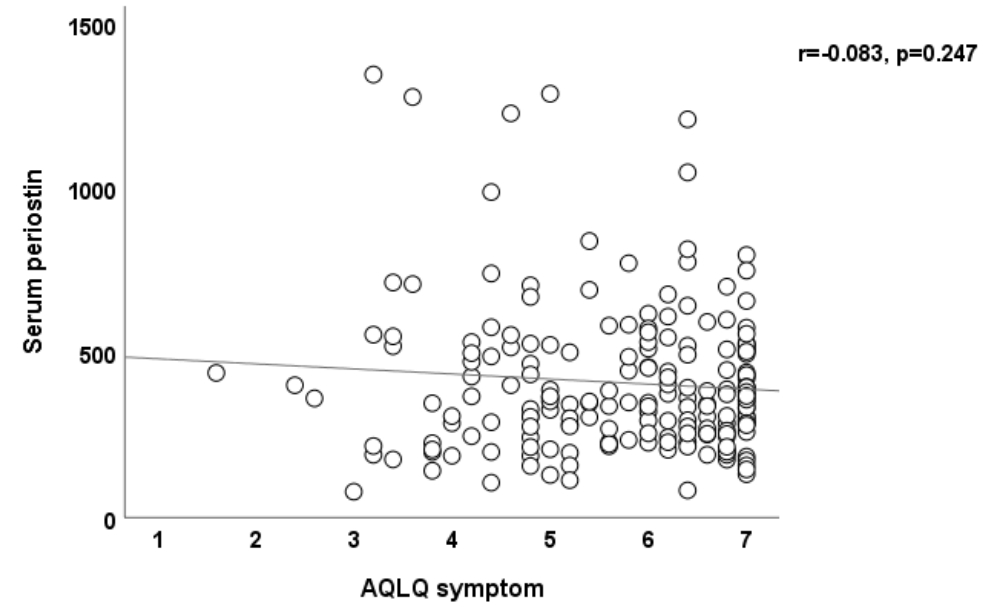
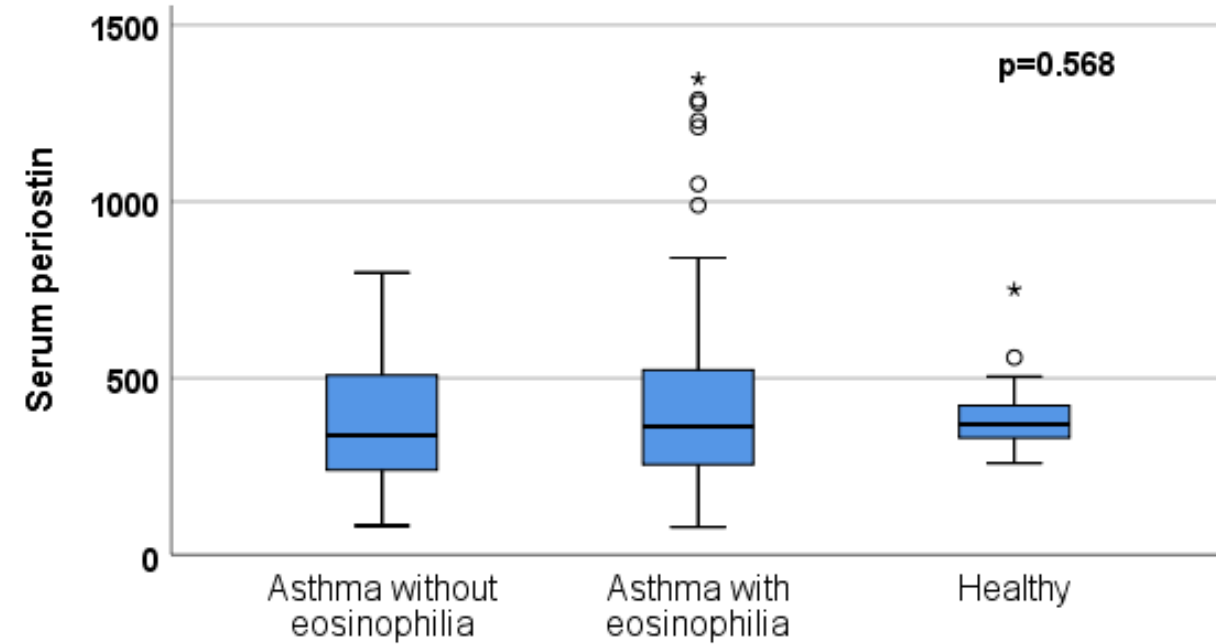
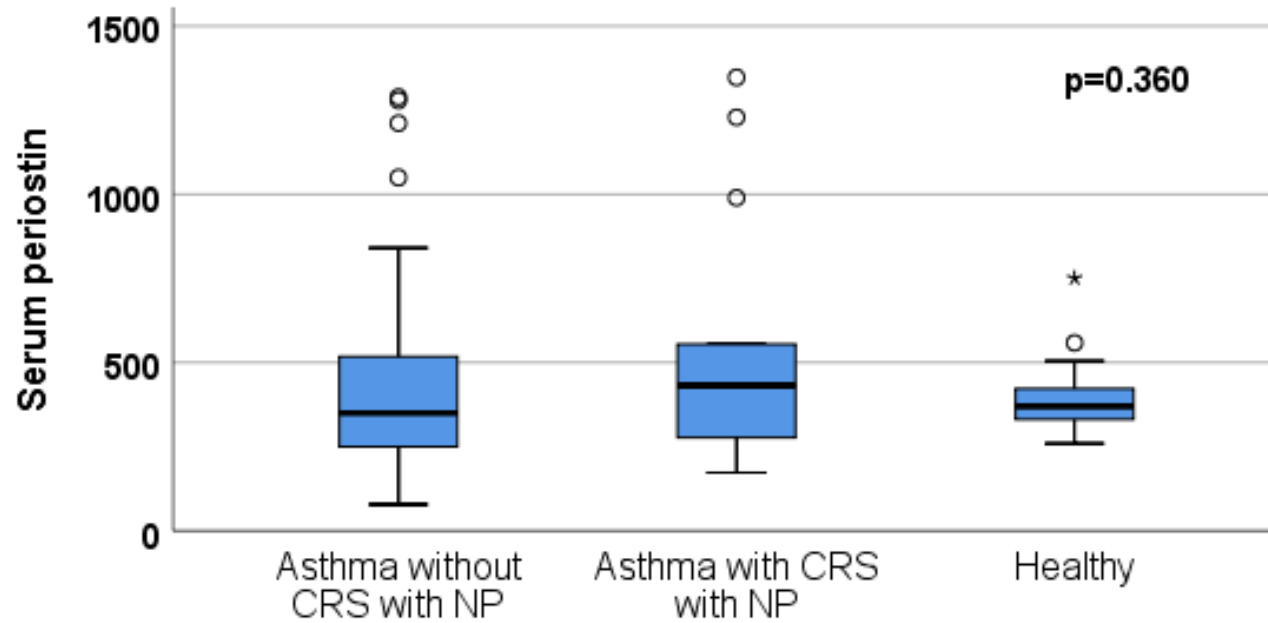


Figure 5 Comparison of serum periostin in asthma subgroup

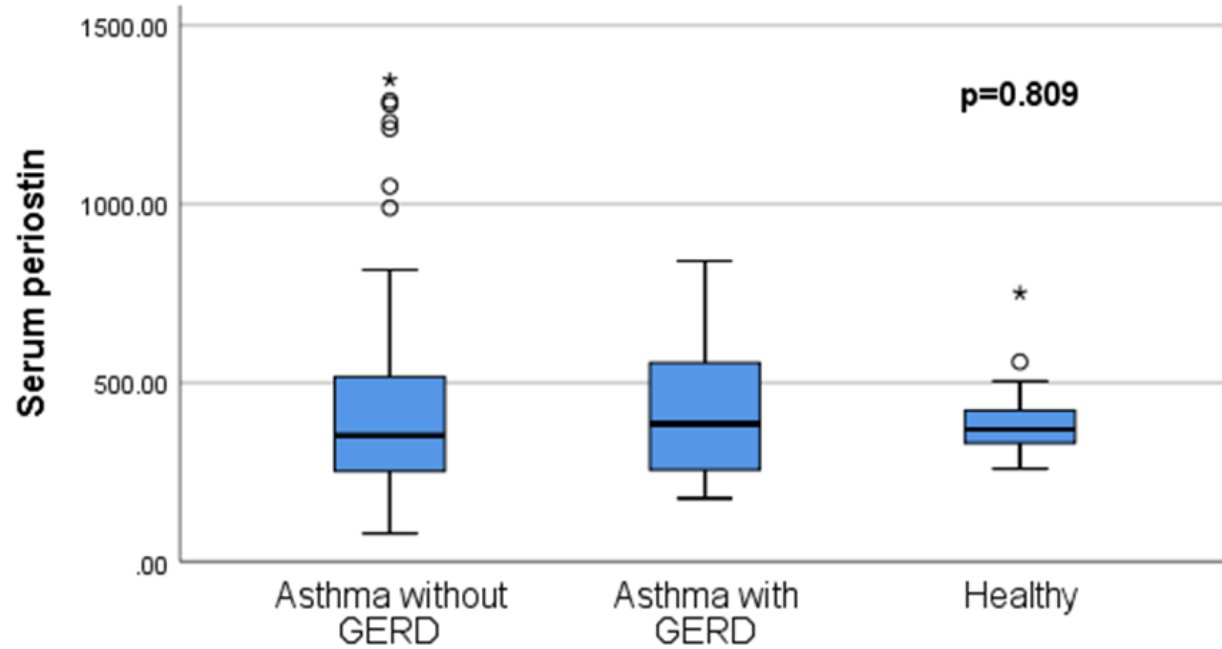


	Group								
	Asthma without CRS with NP			Asthma with CRS with NP			Healthy		
	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75
Serum periostin	349.28	249.69	517.13	431.57	277.13	554.63	369.63	331.42	422.13

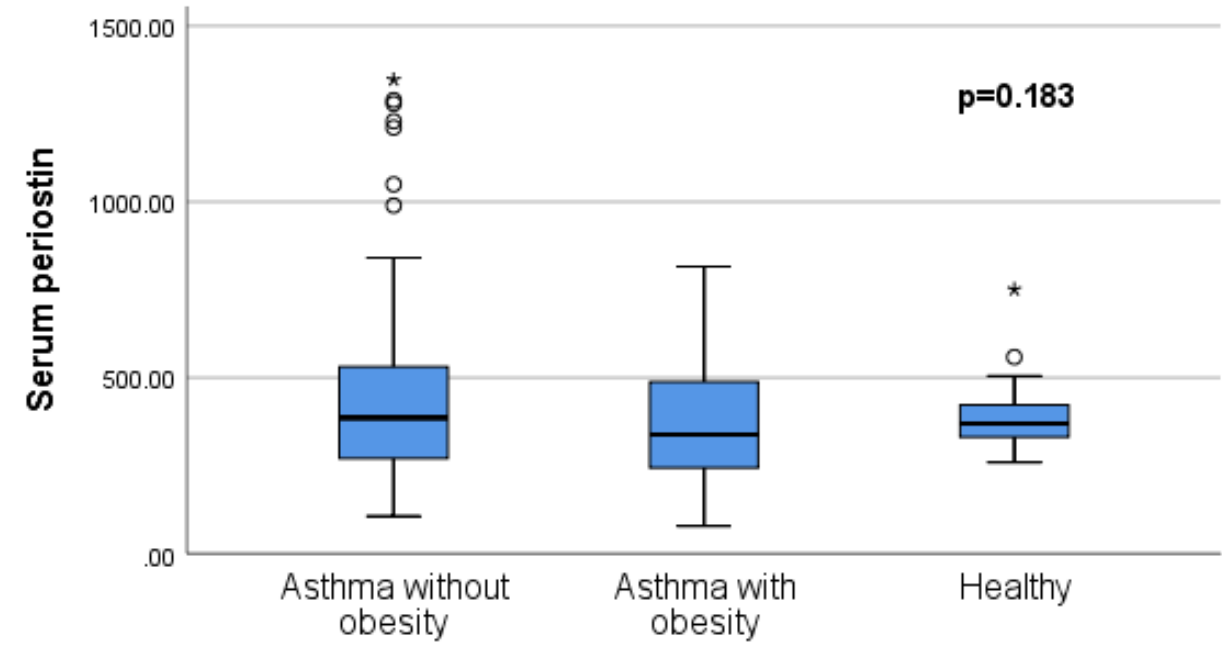
	Group								
	Asthma without eosinophilia			Asthma with eosinophilia			Healthy		
	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75
Serum periostin	338.38	235.58	517.13	363.38	254.63	523.38	369.63	331.42	422.13

CRS: chronic rhinosinusitis
 NP: nasal polyp
 CRS and NP are diagnosed by clinician

Figure 5 Comparison of serum periostin in asthma subgroup

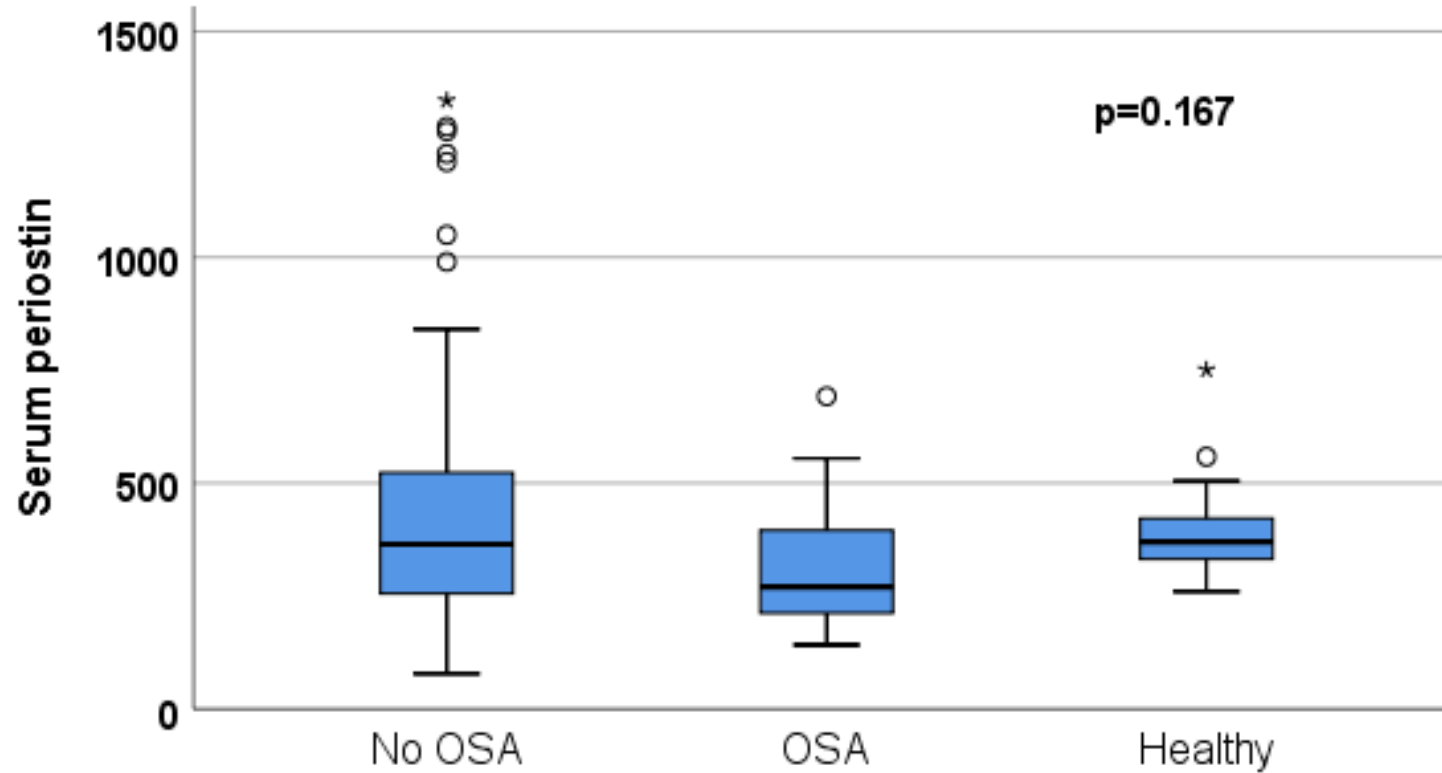


	Asthma without GERD			Asthma with GERD			Healthy		
	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75
Serum periostin	352.13	252.13	517.13	384.63	255.88	555.88	369.63	331.42	422.13



	Asthma without GERD			Asthma with GERD			Healthy		
	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75
Serum periostin	352.13	252.13	517.13	384.63	255.88	555.88	369.63	331.42	422.13

Figure 5 Comparison of serum periostin in asthma subgroup



	No OSA			OSA			Healthy		
	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75	Median	Percentile 25	Percentile 75
Serum periostin	364.75	254.63	523.38	269.75	207.25	443.38	369.63	331.42	422.13

Figure 7 Correlation of serum periostin and serum specific IgE

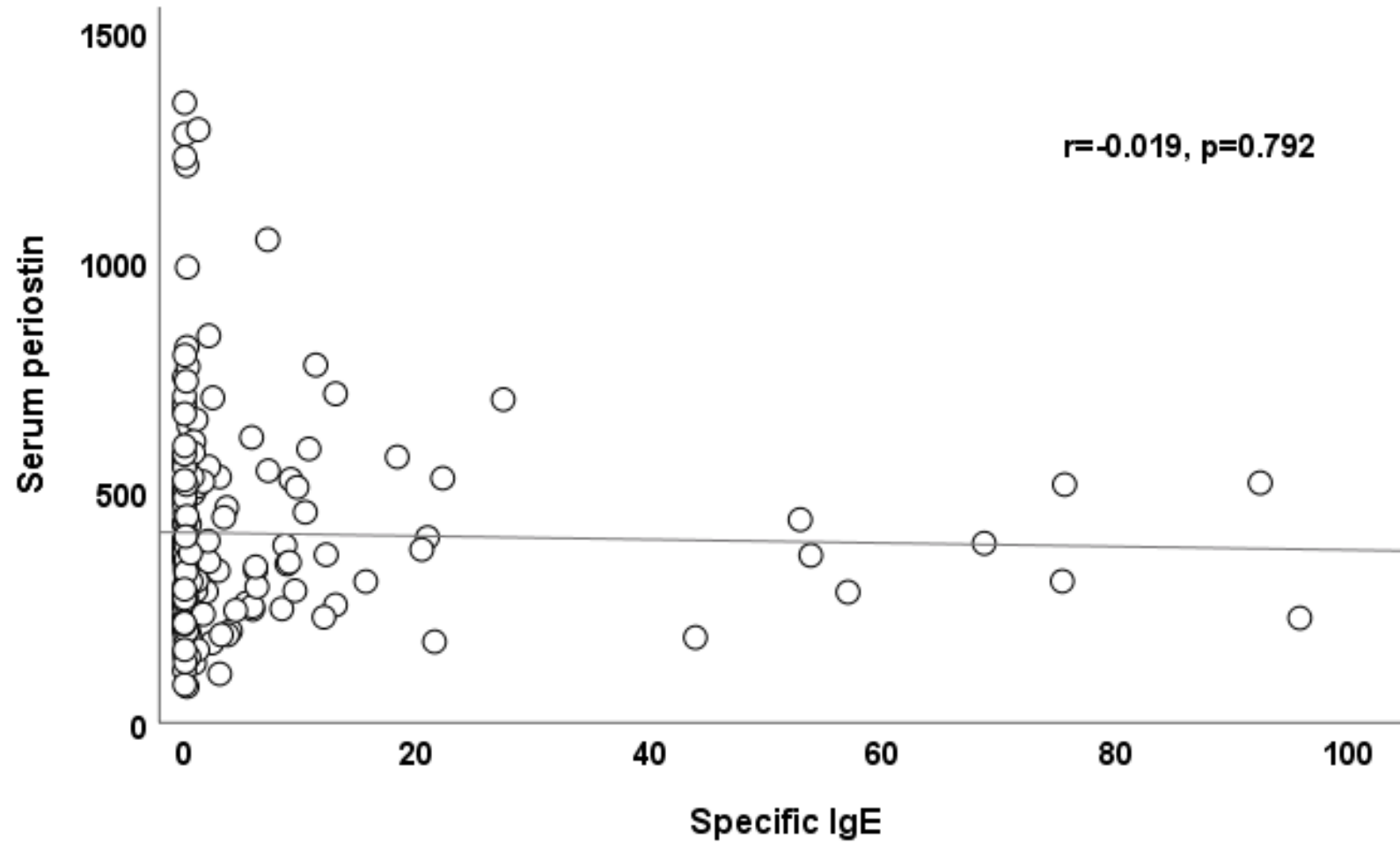
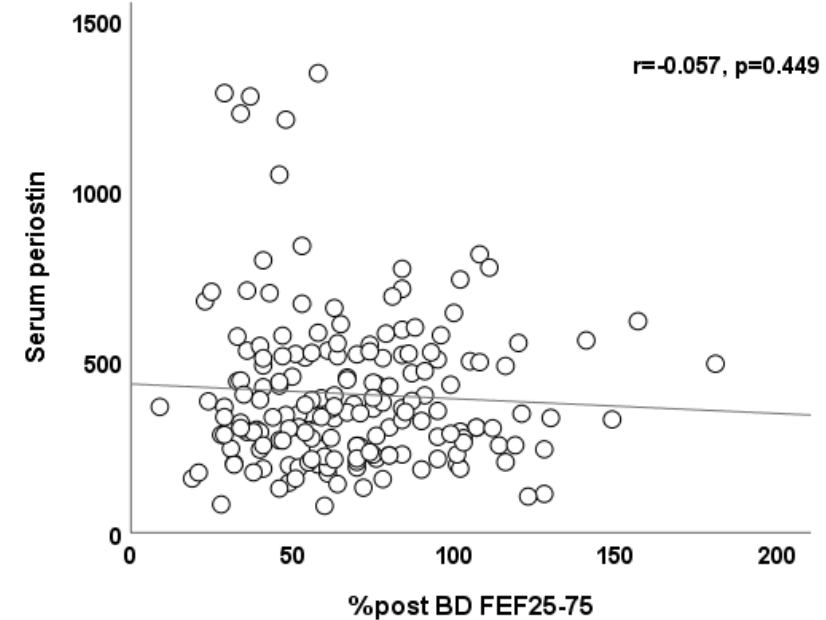
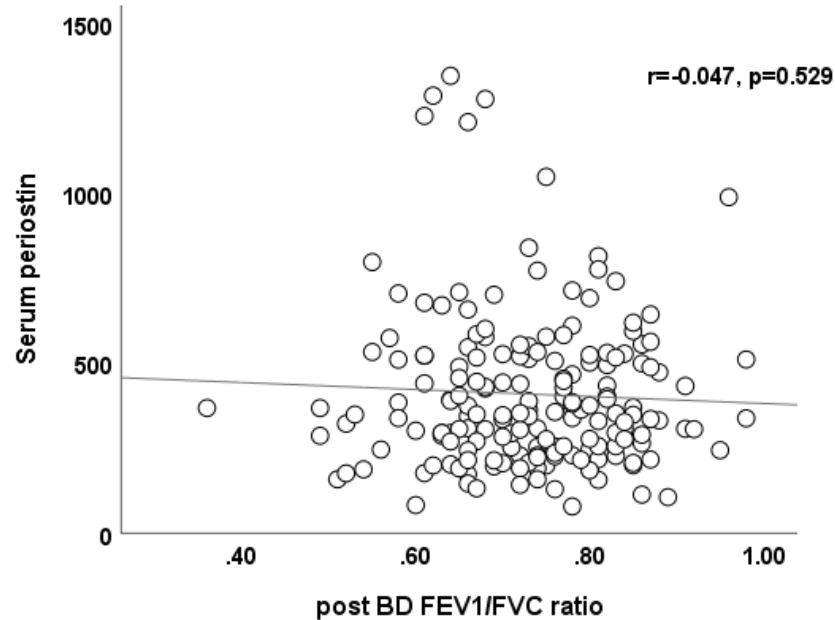
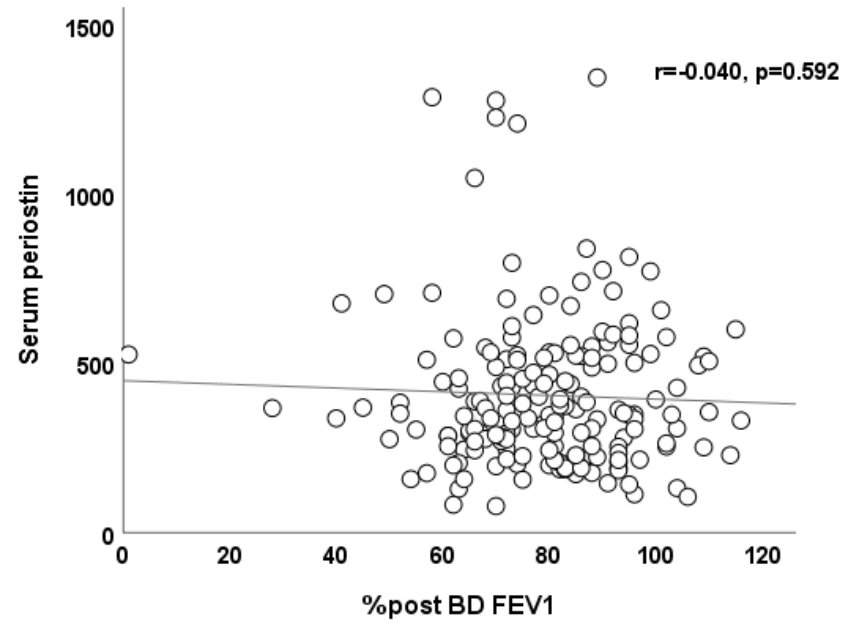
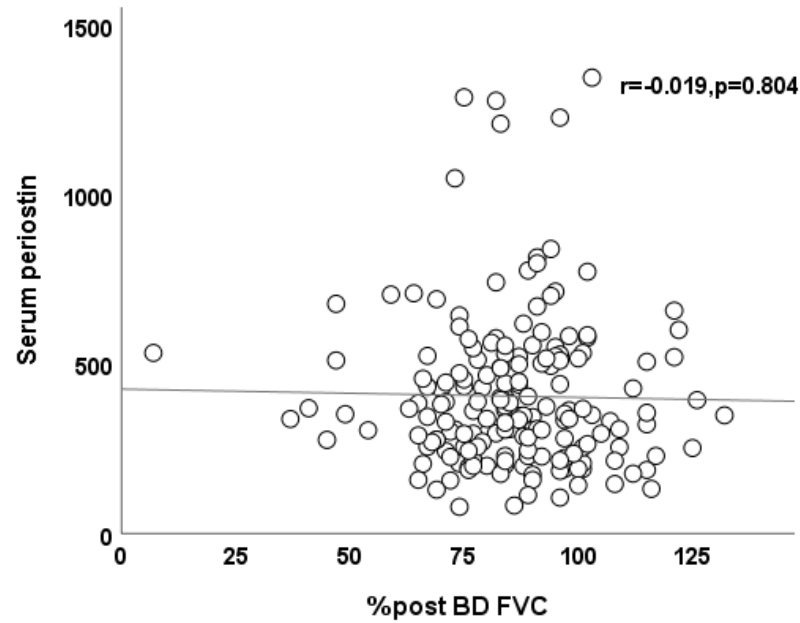


Figure 8 Correlation of serum periostin and lung function



Conclusion



- There is no increased serum periostin levels in asthma patients with allergic rhinosinusitis compared to asthma patients without allergic rhinosinusitis
- There is no correlation between serum periostin either asthma control or asthma-related quality of life
- Serum periostin is increased in eosinophilic asthma and asthma with chronic rhinosinusitis with nasal polyp

THANK YOU