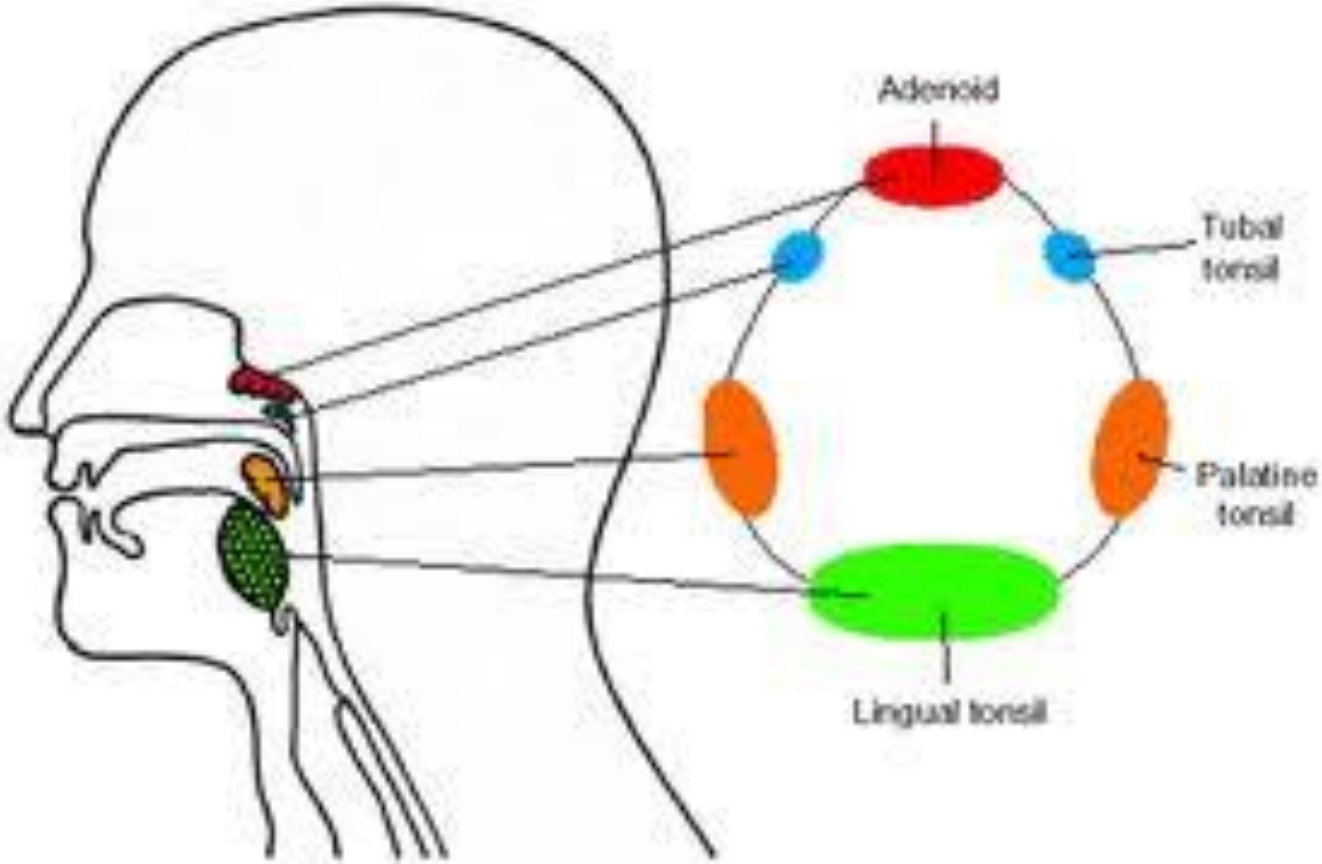
The Possible of Role of Apoptosis in the Pathogenesis of Chronic Tonsillitis and Tonsillar Hypertrophy

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- Tonsils and adenoids are the important components of immune system
- Waldeyer ring

Waldeyer ring



Histological structure

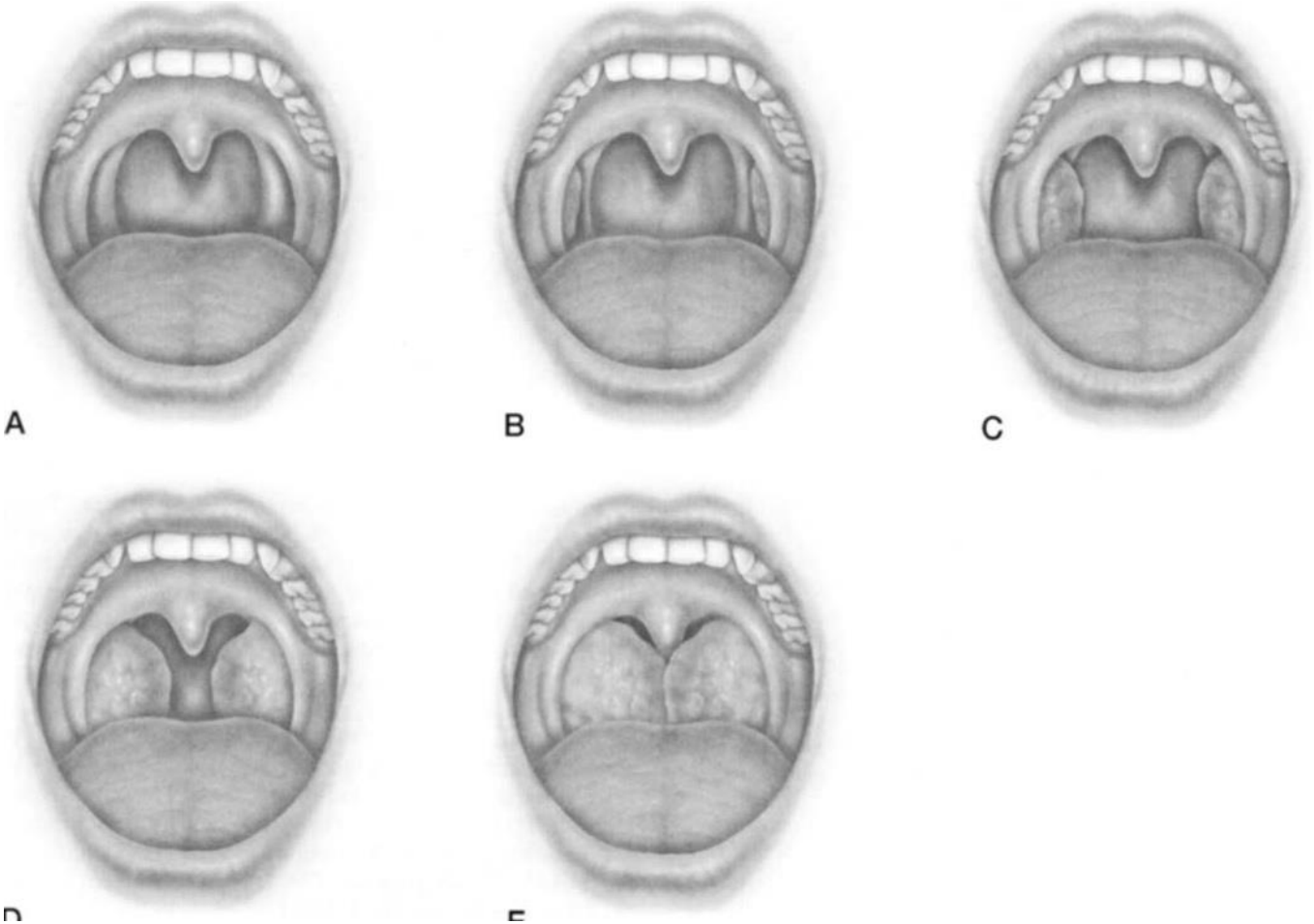
- 10-30 crypt
- 4 microcompartments
  - *Lymphoepithelium*
  - *Follicular germinal center*
  - *İnterfollicular area*
  - *Mantle zone*

Chronic adenotonsillitis

&

Adenotonsillar hypertrophy

Tonsillar Hypertrophy



Apoptosis????

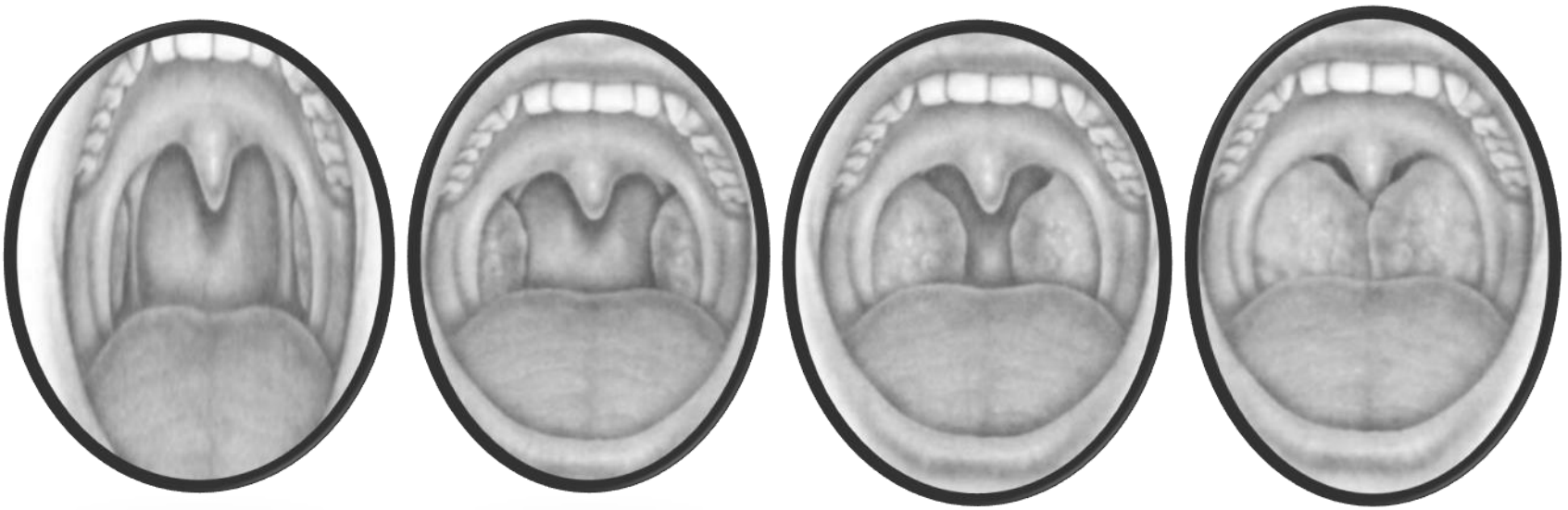
- The aim of this study is to compare the apoptosis between chronic tonsillitis and tonsillar hypertrophy and to study the possible role of apoptosis in the tonsillar diseases.

Material and Method

Hacettepe University Faculty of Medicine Department of Otolaryngology-Head & Neck Surgery and Department of Histology and Embryology

Material and Method

- June 2012 - May 2014
- 43 patient (23 male, 20 female)
- 2-16 age range
- Chronic tonsillitis and tonsillar hypertrophy
- Tonsils were assembled into groups according to their size (Friedman)



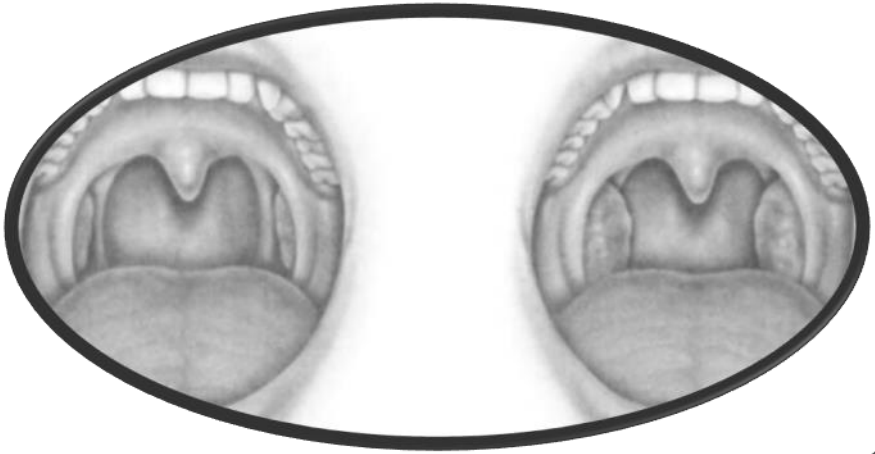
Grade 1
(n: 6)

Grade 2
(n: 16)

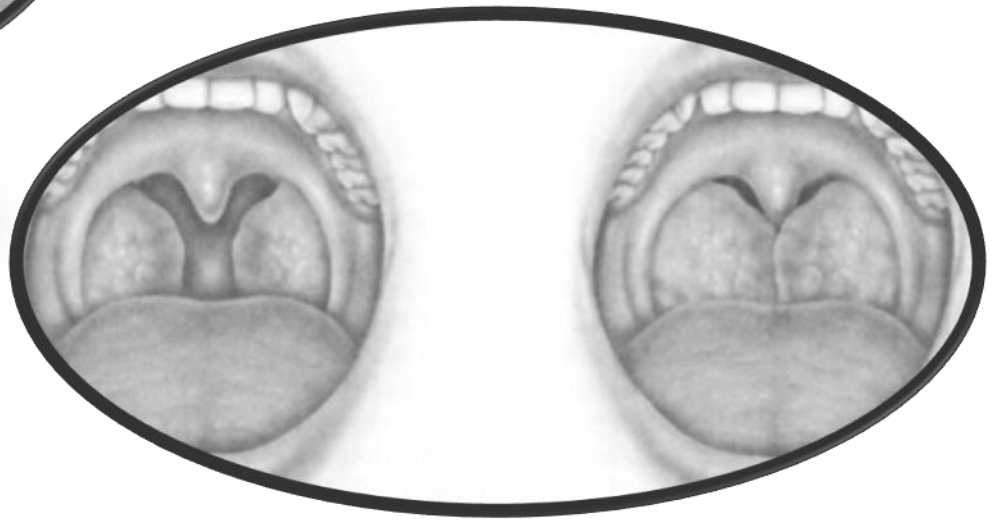
Grade 3
(n: 13)

Grade 4
(n:8)

Grade 1+ Grade 2 (n:22)



Grade 3+ Grade 4 (n:21)



Determination of Apoptosis

- TUNEL assay
- Apoptotic cells
- Apoptotic cells were counted in 3 different microscopic fields and their average was taken for every microcompartment
  - ✓Intrafollicular
  - ✓İnterfollicular
  - ✓İntraepithelial
  - ✓Subepithelial *

TUNEL

- Terminal deoxynucleotidyl transferase end labeling.
- The formation of DNA strand breaks early in apoptosis is detected by enzymatic labelling of the 3’-OH termini with modified nucleotides

Determination of Apoptosis

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- By this way, we studied the apoptosis amount, difference between hypertrophic and non-hypertrophic tonsils and the effect of apoptosis to the hypertrophy. Also the apoptosis rate between microcompartments was evaluated.

Results

- The difference between tonsil grades for apoptosis is not statistically significant.

Grade	**Mean apoptotic cell ± Standart deviation(SD)**	**Kruskal Wallis Varience Analysis**
Grade 1 (n=6)	9.5±5.54	χ^2=3.96 p= 0.266
Grade 2 (n=16)	12.88±7.29	
Grade 3 (n=13)	13.31±5.69	
Grade 4 (n=8)	12±2.14	

- Between (grade 1+ grade 2) group and (grade 3+grade 4) group, there is no statistically significant difference for apoptosis.

Grade	**Mean apoptotic cell ± Standart deviation(SD)**	**Mann Whitney U test**
Grade 1 + Grade 2 (n=22)	11.95± 6.90	Z= 1.355 P= 0.175
Grade 3 + Grade 4 (n=21)	12.81± 4.63	

- The age 6 was used as a cut-off to compare apoptosis. The difference between two groups, grade1+grade2 and grade3+grade4 is not statistically significant for patients below 6 years of age.

≤6 years old

Grade	**Mean apoptotic cell ± Standart deviation(SD)**	Mann Whitney U test
Grade 1 + Grade 2 (n=11)	14.27± 8.41	Z= 0.302 p= 0.762
Grade 3 + Grade 4 (n=14)	12.50± 4.95	

- The difference between these groups for apoptosis is statistically significant for patients above 6 years of age.

>6 years old

Grade	**Mean apoptotic cell ± Standart deviation(SD)**	**Mann Whitney U test**
Grade 1 + Grade 2 (n=11)	9.64± 4.17	Z= 2.195 p= 0.028
Grade 3 + Grade 4 (n=7)	13.43± 4.19	

- ✓In tonsillar tissues, apoptosis amount was evaluated for every microcompartment. (Intrafollicular, Interfollicular, Intraepithelial, Subepithelial). These values are not significant statistically.

Grade	**Mean apoptotic cell ± Standart deviation(SD)**			
	Intrafollicular	**Interfollicular**	**Subepithelial**	**Intraepithelial**
Grade 1 (n=6)	5.67±1.87	1.67±0.56	1.33±0.33	0.83±0.31
Grade 2 (n=16)	8.06±1.12	2.06±0.34	1.50±0.28	1.25±0.42
Grade 3 (n=13)	7.23±1.00	2.15±0.32	2.15±0.32	1.77±0.43
Grade 4 (n=8)	6.75±0.59	2.25±0.31	1.38±0.32	1.63±0.49
Kruskal Wallis Varience Analysis	χ^2= 2.875 p= 0.411	χ^2= 1.624 p= 0.654	χ^2= 3.703 p= 0.295	χ^2= 2.902 p= 0.407

- The difference between grouped tonsils microcompartements is not statistically significant.

Grade	**Mean apoptotic cell ± Standart deviation(SD)**			
	Intrafollicular	**Interfollicular**	**Subepithelial**	**Intraepithelial**
Grade 1 + Grade 2	7.41±4.52	1.95±1.33	1.45±1.06	1.14±1.49
Grade 3 + Grade 4	7.05±2.97	2.19±1.03	1.86±1.11	1.71±1.45
Mann-Whitney U test	Z= 0.086 p= 0.932	Z= 1.017 p= 0.309	Z= 1.197 p= 0.231	Z= 1.661 p= 0.097

Discussion

- Apoptosis regulates the life span of lymphocytes and we showed the apoptosis immunohistochemically in tonsillar tissue.

- There is no difference between chronic tonsillitis and tonsillar hypertropy for apoptosis in all age groups and ≤6 years old patients. But in >6 years old patients, we found that there is more apoptosis in hypertrophic tonsils.

- In microcompartments, the most apoptosis amount in numerical valued was encountered in intrafollicular space.
- Kucera
- Kelseo
- Dono

Conclusion

- In conclusion, apoptosis has a role in hypertrophy pathogenesis.
- We believe that mainly immunuhistochemical investigation methods of tonsil ve adenoids provide more information about lymphoid tissue microanatomy.

TEŞEKKÜRLER…

EBV

- EBV → Tonsil %43 Adenoid %13 (Al-Salam ve ark)
- EBV ile enfekte hücreler → İnterfoliküler alanda
- İntrafoliküler/interfoliküler
- İnterfoliküler alan apoptoz ↔ EBV