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Evaluation of Patients with Dry Eye Disease for the Presence of Conjunctival *Chlamydia Trachomatis* and *Ureaplasma Urealyticum* Infection



Presented by

Dr. Maha Mohssen Abdelfattah

MD Clinical Microbiology and Immunology

Lecturer and Consultant of Microbiology

Research Institute of Ophthalmology, Cairo, Egypt

Outline

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Dry Eye Disease (DED)

5- 6% of the population.

1 out of 7 individuals aged 65 to 84 years.

International Dry Eye Workshop (DEWS)

- **Multifactorial disease**
- **Tears**
- **Ocular surface**

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Symptoms

- Discomfort
- Visual disturbance
- Tear film instability
- Damage to the ocular surface
- Inflammation

Chronic inflammatory reaction.

Vital dye staining of the cornea and conjunctiva.

Inflammatory Molecules + Stagnant Tear Film + Decreased Level of Mucins

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Inflammatory Molecules + Stagnant Tear Film + Decreased Level of Mucins

- **Destruction of epithelial tight junctions.**
- **Sloughing of the ocular surface epithelia.**
- **Alterations in the concentration and type of bacteria present**

CNS.
Staphylococcus aureus
Streptococcus spp.
Pseudomonas aeruginosa
Klebsiella spp.

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DED ⟷ **Chronic Conjunctivitis**

Chronic Conjunctivitis → **DED**

- **Chronic inflammation of the conjunctiva also may be caused by persistent infection leading to the development of DED.**

Chlamydia trachomatis ***Ureaplasma urealyticum***

low-grade nonspecific inflammation

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Development of DED as a result of persistent infection with

Chlamydia trachomatis* and *Ureaplasma urealyticum

in patient's conjunctiva

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- **58 patients**
- **Age Range between 20 - 50 years**
- **Clinically diagnosed as DED**

by *Schirmer's test and Tear Film Break-up Time (BUT)*

- **Control Subjects: 27 non-dry eye of the same age range.**

Experimental Work

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Ophthalmological Procedures

- Slit lamp biomicroscopic examination by an ophthalmologist
- Schirmer's test and Tear Film Break-up Time (BUT)

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Ocular Samples

Conjunctival Scrapings

- **Culture.**
- **Direct Fluorescent Antibody Assay (DFA)**
- **Polymerase Chain Reaction (PCR)**

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Relation of *Chlamydia trachomatis* by PCR according to age among DED patients

			Age Groups		Total
			=< 40 years	> 40 years	
CT PCR	P	Count	40	4	44
		% within age groups	80.0%	50.0%	75.9%
	N	Count	10	4	14
		% within age groups	20.0%	50.0%	24.1%
Total Count			**50**	**8**	**58**

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Relation of *Chlamydia trachomatis* and *Ureaplasma urealyticum* by PCR, according to age among DED patients

			Age Groups		Total
			=< 40 years	> 40 years	
Both *CT* and *UU* by PCR	Both +ve	Count	22	0	22
		% within age groups	44.0%	0.0%	37.9%
	Others	Count	28	8	36
		% within age groups	56.0%	100.0%	62.1%
Total Count			**50**	**8**	**58**

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Chlamydia trachomatis in DED patients by PCR and DFA

			Group		Total
			Patients	Control	
CT PCR	P	Count	44	2	46
		% within Group	75.9%	7.4%	54.1%
	N	Count	14	25	39
		% within Group	24.1%	92.6%	45.9%
Total Count			**58**	**27**	**85**

			Group		Total
			Patients	Control	
CT DFA	P	Count	38	6	44
		% within Group	65.5%	22.2%	51.8%
	N	Count	20	21	41
		% within Group	34.5%	77.8%	48.2%
Total Count			**58**	**27**	**85**

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Ureaplasma urealyticum in DED patients by PCR

			Group		Total
			Patients	Control	
UU PCR	P	Count	26	1	27
		% within Group	44.8%	3.7%	31.8%
	N	Count	32	26	58
		% within Group	55.2%	96.3%	68.2%
Total Count			**58**	**27**	**85**

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Positivity of Both *Chlamydia trachomatis* and *Ureaplasma urealyticum* in DED patients by PCR.

			Group		Total
			Patients	Control	
Both *CT* and *UU* PCR	Both +ve	Count	22	0	22
		% within Group	37.9%	0.0%	25.9%
	Others	Count	36	27	63
		% within Group	62.1%	100.0%	74.1%
Total		**Count**	**58**	**27**	**85**

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Agreement between DFA and PCR methods for *Chlamydia trachomatis* among DED patients

			CT PCR		Total
			P	N	
CT DFA	P	Count	38	0	38
		% within *CT* DFA	100.0%	0.0%	100.0%
		% within *CT* PCR	86.4%	0.0%	65.5%
		% of Total	65.5%	0.0%	65.5%
	N	Count	6	14	20
		% within *CT* DFA	30.0%	70.0%	100.0%
		% within *CT* PCR	13.6%	100.0%	34.5%
		% of Total	10.3%	24.1%	34.5%
Total Count			**44**	**14**	**58**

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Correlation of conjunctival culture with *Chlamydia trachomatis* by PCR and DFA among DED patients

			Conjunctival Culture		Total
			Gram +ve	Gram -ve	
CT PCR	P	Count	36	8	44
		% within conjunctival culture	83.7%	53.3%	75.9%
	N	Count	7	7	14
		% within conjunctival culture	16.3%	46.7%	24.1%
Total		**Count**	**43**	**15**	**58**

			Conjunctival Culture		Total
			Gram +ve	Gram -ve	
CT DFA	P	Count	31	7	38
		% within conjunctival culture	72.1%	46.7%	65.5%
	N	Count	12	8	20
		% within conjunctival culture	27.9%	53.3%	34.5%
Total		**Count**	**43**	**15**	**58**

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Correlation of conjunctival culture with *Ureaplasma urealyticum* by PCR among DED patients

			Conjunctival Culture		Total
			Gram +ve	Gram -ve	
UU PCR	P	Count	19	7	26
		% within Conjunctival Culture	44.2%	46.7%	44.8%
	N	Count	24	8	32
		% within Conjunctival Culture	55.8%	53.3%	55.2%
Total Count			**43**	**15**	**58**

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Correlation of conjunctival culture with both *Chlamydia trachomatis* and *Ureaplasma urealyticum* by PCR among DED patients.

			Conjunctival Culture		Total
			Gram +ve	Gram -ve	
Both *CT* and *UU* by PCR	Both +ve	Count	18	4	22
		% within conjunctival culture	41.9%	26.7%	37.9%
	Others	Count	25	11	36
		% within conjunctival culture	58.1%	73.3%	62.1%
Total Count			**43**	**15**	**58**

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- **Demographic characteristic of the patients regarding age**
  - 86.2% of the DED patients were below 40 years
- **The average duration of the eye affliction**
  - Within the range of 4-5 years
  - With a gradual increase in the severity of symptoms over time
- **Significant increase of detection rate of *Chlamydia trachomatis* in the conjunctiva of DED patients than in the control non dry eye groups, by:**
  - DFA (65.5% Vs. 22.2%)
  - PCR (75.9% Vs. 7.4%)

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- **High frequency of detection rate of *Chlamydia trachomatis* in DED patients**
  - Less than 40 years of age in comparison to those above 40 years
  - (80% Vs. 50%)
- **Statistical significant increase of detection rate for *Ureaplasma urealyticum* in the DED group in comparison to the control group**
  - (44.8% Vs. 3.7%)
- **Both *Chlamydia trachomatis* and *Ureaplasma urealyticum* were detected by PCR in the DED patients**
  - (37.9% Vs. 0.0%)

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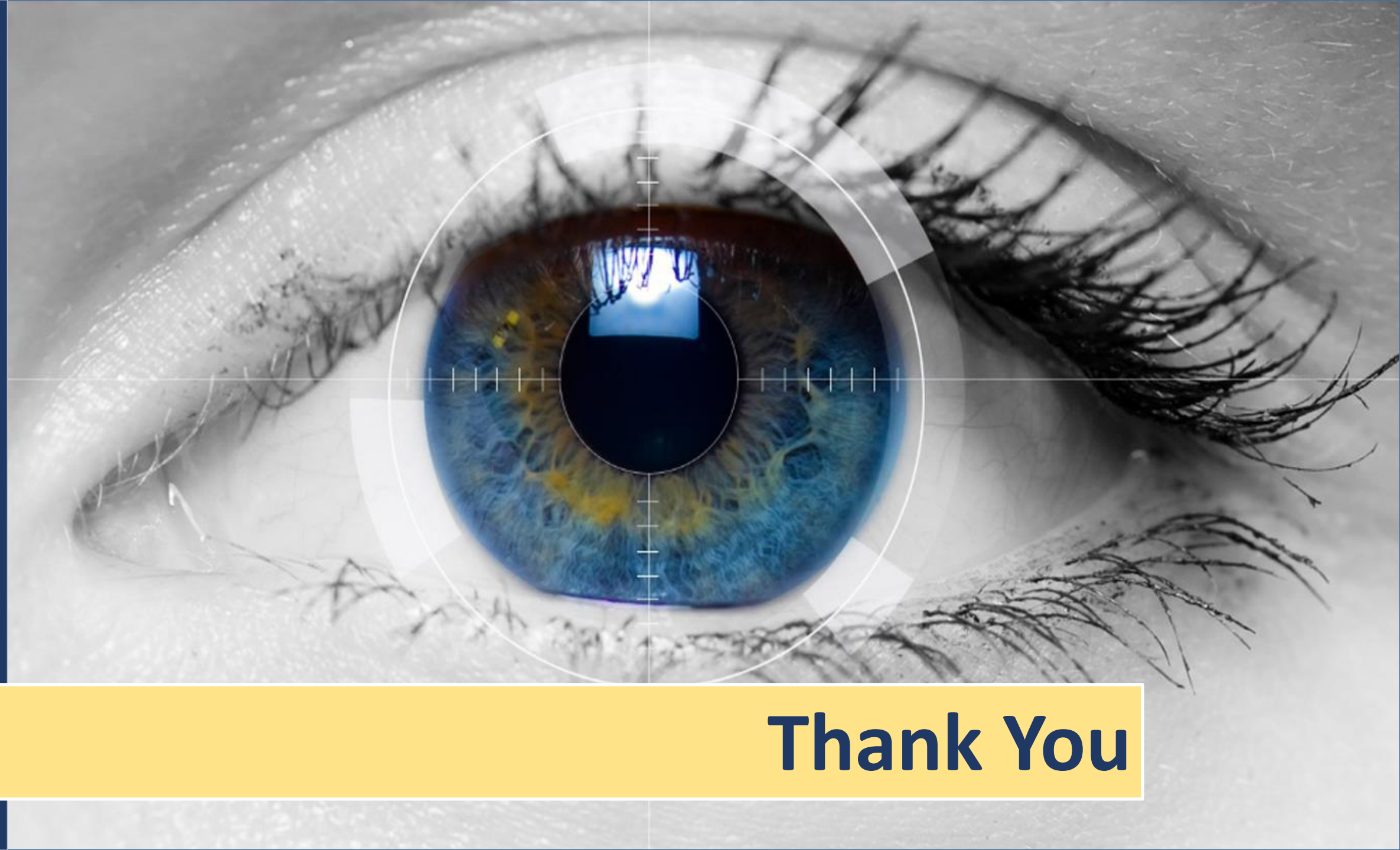
- **Both organisms were detected in higher frequency in young patients of the DED**
  - Below 40 years of age, more than those above 40 years
- **Urogenital disease caused by both *Chlamydia trachomatis* and *Ureaplasma urealyticum***
  - Chronic conjunctivitis.
  - DED.
- **Via the blood**

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- **Statistical significance between Gram positive and Gram negative bacteria isolated from the conjunctiva of DED patients, with *Chlamydia trachomatis* detected by;**
  - PCR: 83.7% Vs. 53.3%
  - DFA: 72.1% Vs. 46.7%

- **Inflammation associated with DED.**
  - Colonization of bacteria
  - *Chlamydia trachomatis*
  - Development and maintenance of inflammation
  - Primary role in pathogenesis of the disease
  - Secondary role in increasing bacterial colonization
  - Microbial load associated in DED patients



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