Impact of Chlamydia Trachomatis infection on male infertility

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Estimated Prevalence of Curable STIs Among Adults in Millions 1999 (WHO)

• North America	3 million
• Latin America (incl. Carribbean)	18.5
• Western Europe	4.0
• N.Africa and Middle East	3.5
• Sub Saharan Africa	32.o
• Eastern Europe and Central Asia	6.0
• East Asia and Pacific	6.0
• South and S.East Asia	48
• Australia and New Zealand	250,000. Thousand
• Global Total	116.5 million.

Estimated New Cases of Chlamydia Trachomatis Among Adults in millions (WHO) 1999

• North America	4million
• Latin America &The Carbibean	9.5
• Western Europe	5.0
• N.Africa &Middle East	3.0
• Sub Saharan Africa	16
• Eastern Europe & Central Asia	6.0
• East Asia and Pacific	5.3
• South and S.East Asia	43.0
• Australia and New Zealand	340,000 Thousand
• Global	92million

Global concern is due to long term morbidity and irreversible sequelae

• Asymptomatic	Detected late
• Young people	Higher incidence
• Impact on Fertility	More in Females & long term sequelae.
• Chronic Cervicitis (C.Trachomatis)	Increased rates of dysplasia and sero conversion to HIV

Sequelae of C. trachomatis

- **In Males**
- Prostatitis
- Urethretis
- Epididymitis
- Vesiculitis
- Orchitis

- **In Females**
- Salphingitis
- Cervicitis
- Endometritis
- Oophoritis

Aims and Objectives

To study the impact of Chlamydia Trachomatis infection on the seminal parameters of asymptomatic infertile males.

Materials and Methods

- Design: cohort studies
- Setting: Male Infertility Clinic
- Subjects: asymptomatic infertile males and their spouses
- Parameters studied: Semen analysis and leucocyte count (WHO), serum and seminal antibodies for C.Trachomatis, anti sperm antibodies, (Mar test), PCT, sperm mucus penetration test,acrosome reaction test

Results

Positive correlation ($p<0.001$) with tubal infertility (Eggert-Kruse 1997)

Seminal parameters and sperm-mucus penetration not affected

Leucocytospermia no correlation (Videau 2001)

Decreased seminal parameters were shown due to IgA antibodies in the semen (Witkin 1995) of infertile men

Positive correlation with previous H/o STIs

Detection by culture difficult

Serovar E showed significant decrease in sperm motility (Hosseinzadeh 2001)

Antibodies to both C. Trachomatis and C. pneumoniae were dectected in semen of infertile men (Bollerman 1998)

Table-1 Relationship of Chlamydia serology with the male factor: variables of semen analysis (Eggert-Kruse et al , 1997)

	Negative	Positive	Total	
Semen analysis				
Oligospermia	17.6(202/1148)	15.7(26/166	17.4(228/1314)	ns
Sperm count<40 mill/ml	44.6(512(1148)	41.0(68/166	44.1(580/1314)	ns
Asthenospermia <20%	9.2(105/1138)	6.6(11/166)	8.9(116/1304)	ns
Progressive motility<40%	37.3(425/1138)	25.9(43/166	35.9(468/1304)	ns
Sp Morp.<60% normal	35.7(391/1095)	32.5(50/154	35.3(441/1249)	ns
Ph>7.4	44.4(508/1143)	45.8(76/166	44.6(584/1309)	ns

Table-2 Relationship of Chlamydia serology with the tubal factor C.Trachomatis. antibodies

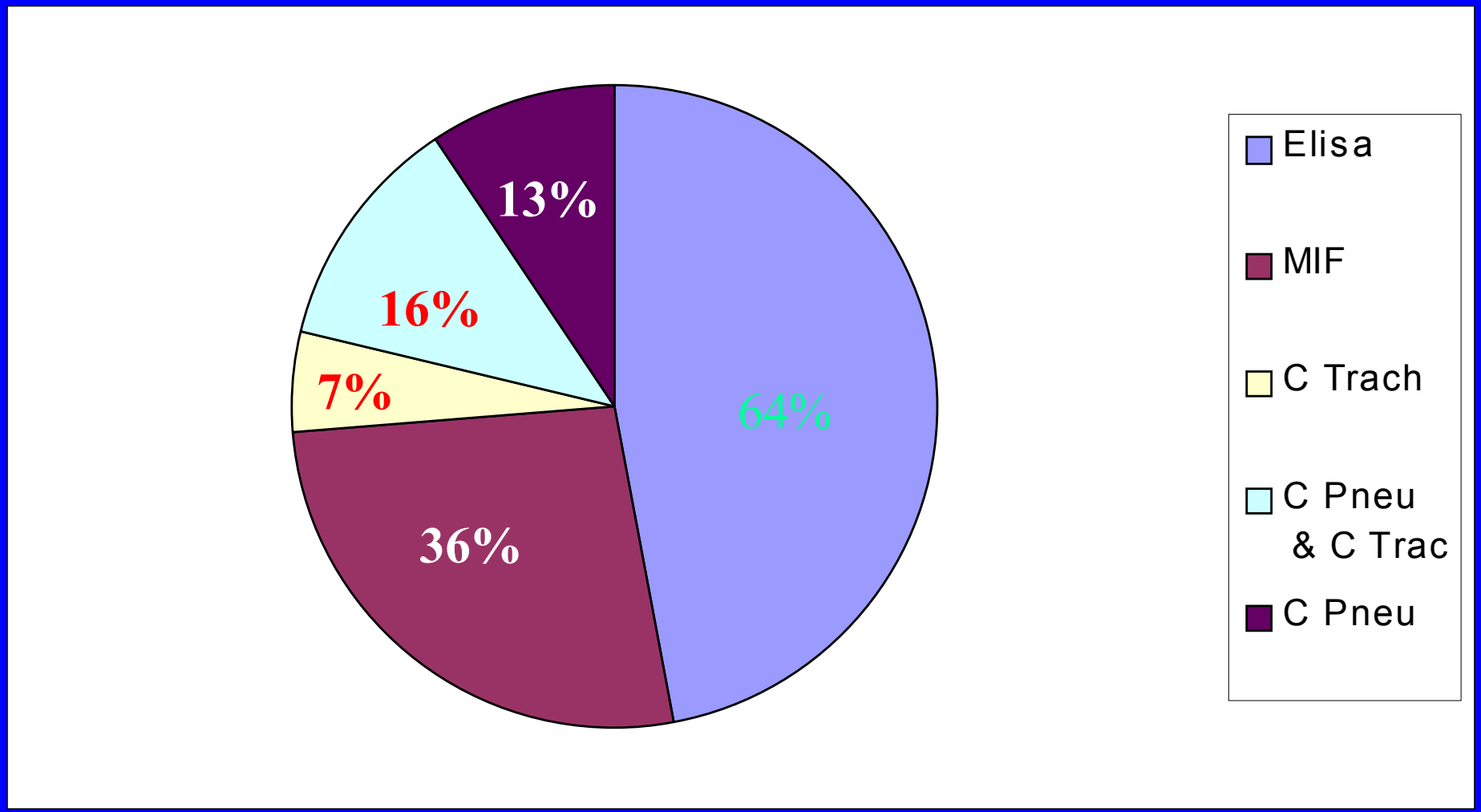
Tubal factor	Negative	Positive	Total	p
Patency of both tubes	70.(776)	49.8 (140)	66.2 (916)	<0.001
Both tubes blocked/one blocked (total)	29.6(326)	50.2 (141)	33.8 (467)	<0.001

Table-3 Relationship of chlamydial serology with the male factor sp.mucus interaction in vitro and in vivo as parameters of functional capacity

(Eggert-Kruse1997)

Sp-mucus pent.test	Negative %	Positive %	Total %	p
1) Motility reduced after 2 hrs. (partners cervical mucus)	27.2 (304/1119)	25.5 (42/165)	26.9 (346/1284)	ns
Motility after 6 hrs	30.1(337/1119)	30.3 (50/165)	30.1 (387/1284)	ns
2) Motility at 2 hrs (donor mucus)	23.5 (259/1104)	19.8 (32/162)	23.0 (29171266)	ns
6hrs	26.5 (292/1104)	24.1(39/162)	26.2 (33171266)	ns
PCT neg	23.5 (24571044)	31.9 (47/147)	24.5 (292/1191)	ns

Chlamydia IgA-Antibodies in seminal plasma
Comparison of positive results with Elisa and MIF



Mechanism of Action of C.Trachomatis Infection Affecting Male Fertility.

* Humoral-Antibodies present in the serum and semen as a response to C.Trachomatis related inflammation
* Local- Anti sperm antibodies in the seminal plasma
* Inflammation of accessory glands decrease in carnitine, Zn, fructose, alpha glucosidase
* Direct effect on the gamete reducing fertilising potential ROS, antibodies to C. Trachomatis, ASA (decrease in fertilising potential of the spermatozoa)
* Elementary bodies within the gamete

Reasons for Controversies

- Control samples (proven fertile) for true prevalence is needed
- Individual variations of samples
- Variables affecting fertility
- Cross-reaction with normal flora and other pathogens
- Particular serovar may show an impact
- Antibodies means past infection,may not correlate with present status

Conclusions

- Younger people are more frequently affected by C.Trachomatis
- Impact is positively associated with tubal infertility in females
- Its impact on male fertility is controvertial,as presence of antibodies or leucocytospermia did not decrease seminal parameters
- Indirect effect on fertilising potential cannot be ruled out
- Certain serovars and species specific antibodies may affect seminal parameters

Future Strategies to study the impact of C.Trachomatis on male fertility

- Use of a sensitive method of detection
- True prevalence determined by control studies
- Estimating seminal biochemical factors affecting fertility
- Studing species -specific antibodies and Serovars affecting fertility
- In-vitro studies to determine cause and effect

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