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# Incidence of antisperm antibodies and its association to subfertility in couples undergoing assisted reproductive technologies, at a selected centre.

By

Varuni Tennakoon


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Thesis submitted to the University of Sri Jayawardenepura for the award of the Degree of Master of Philosophy in Immunology on 31st December, 2010

I certify that the candidate has incorporated all corrections, amendments and additions recommended by the examiners.

.....

30/12/2010

Prof. Surangi G Yasawardene

Head, Department of Anatomy

Faculty of Medical Scienceds

University of Sri Jayewardenepura

## Declaration

The work described in this thesis was carried out by me under the supervision of,

Professor Surangi Gayaneetha Yasawardene

Professor of Anatomy

Doctor Deepal Senaka Weerasekera

Consultant Obstetrician and Gynaecologist

Doctor James William Catt

Consultant Embryologist

A report on this has not been submitted in whole or in part to any university or any other institution for another Degree/Diploma.

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Varuni Tennakoon

30.12.2010

.....

Date

## Declaration by the Supervisors

We certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the University of Sri Jayawardenepura for the purpose of evaluation.

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Prof. Surangi G Yasawardene

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Dr. Deepal S Weerasekera

.....

Dr. James W Catt

**Dedicated to my parents,**

**My husband Chamil and my two sons**

**Dinu and Mithu**

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# Abbreviations

| | | |
|---|---|---|
| **ART** | - | Assisted reproductive technologies |
| **ASA** | - | Antisperm antibodies |
| **Chi-sq** | - | Chisquare |
| **cm** | - | Centimetres |
| **CR** | - | Cleavage rate |
| **ELISA** | - | Enzyme linked immunosorbent assay |
| **ESHRE** | - | European society for human reproduction and embryology |
| **ET** | - | Embryo transfer |
| **Fc** | - | Fragment crystalizable |
| **FCM** | - | Flow cytometry |
| **FR** | - | Fertilization rate |
| **FSH** | - | Follicular stimulating hormone |
| **GnRH** | - | Gonadotrophin releasing hormone |
| **hCG** | - | Human choriogonadotrophin |
| **IBT** | - | Immunobead test |
| **ICSI** | - | Intracytoplasmic sperm injection |
| **Ig** | - | Immunoglobulin |
| **i-IBT** | - | Indirect immunobead test |
| **IU** | - | International units |
| **IUI** | - | Intra uterine insemination |
| **IVF** | - | In vitro fertilization |
| **MAR** | - | Mixed antiglobulin reaction |

| | | |
|---|---|---|
| **mil** | - | Millions |
| **ml** | - | Millilitres |
| **mm** | - | Millimetres |
| **n** | - | number |
| **PID** | - | Pelvic inflammatory disease |
| **PR** | - | Pregnancy rate |
| **rpm** | - | rounds per minute |
| **SD** | - | Standard deviation |
| **SIT** | - | Sperm immobilization test |
| **TAT** | - | Tray agglutination test |
| **WHO** | - | World health organization |
| **ZP** | - | Zona pellucida |

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## ABSTRACT

The presence of antisperm antibodies (ASA) can reduce fecundity in both males and females. The immuno-regulatory mechanisms of generation of ASA, their effects on gametes and gamete interactions have been studied extensively; however, some of its clinical implications on subfertility are disputed so far. The literature in the field is quite scarce in Sri Lanka. With the availability of assisted reproductive technologies (ART), detection of the possible causes of subfertility will enable to streamline the treatment. The present study was performed to investigate the incidence of ASA in subfertile couples, and their effects on fertilization processes and pregnancy outcome following ART procedures (intra uterine insemination-IUI / in vitro fertilization-IVF).

Two hundred and thirty subfertile couples were studied from January 2006 to January 2009. Relevant clinical data were obtained by self administered questionnaire and clinical examination. Presence of ASA was elicited using mixed antiglobulin reaction latex bead test (SpermMAR, Fertipro NV, Belgium). Spermatozoa, seminal plasma and serum samples in males and cervical mucus, serum and follicular fluid in females were analyzed for ASA. The test was considered positive if 30% or more of the motile

sperm were attached to the latex particles. The isotype (i.e. IgA, IgG) and location of ASA (i.e. head, midpiece, tail of the sperm) on the spermatozoa were observed. In couples who underwent IVF, fertilization rate and day 03 cleavage rate of embryos were assessed. The pregnancy and miscarriage rates following each ART procedure were noted.

The incidence of ASA was 20.87% among the subfertile couples. It was 12.61% in males and 8.26% in females. No significant correlation observed with presence of ASA and age, duration of marriage/subfertility, type of subfertility and occupation of both males and females. A statistically significant association (P-value=0.036) between presence of ASA and a history of genital surgery was observed in males. The incidence of ASA was proportionately higher among women who have had previous IUIs (11.7%) compared to the women who did not have IUIs (5.88%).

The total fertilization rate was significantly higher (P-value=0.001) and the total cleavage rate was significantly lower (P-value=0.037) in ASA positives than that of the ASA negatives. No significant difference was observed in fertilization and cleavage rates among the Ig isotypes. However, IgA isotype of ASA demonstrated the highest fertilization rate and the lowest cleavage rate. Head or midpiece+tail bound ASA on spermatozoa exhibited more negative effects on cleavage rate. In ASA positives there was a marked increment in pregnancy rate when they underwent IVF (19.23%) than IUI (13.64%). It was noted that best samples for screening for ASA for male would be IgA ASA on spermatozoa and for female IgA and IgG ASA in serum.