

FETAL SEX RATIO IN SOME DISEASES OF PREGNANCY

THESIS

SUBMITTED IN PARTIAL FULFILLMENT
FOR THE MASTER DEGREE
in Obstetrics and Gynecology

BY

Zahra Mahmoud Youssif
M.B., B.Ch.



SUPERVISED BY

Prof. Dr. IBRAHIM EL MITWALY SAMAHA
Prof. of Obstetrics and Gynecology



Dr. AHMED ISMAIL ABOU GABAL
Lecturer of Obstetrics and Gynecology

1988

FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY
(CAIRO)

1988

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَقُلْ رَبِّ ارْحَمْنِي وَمَنْ لِي بِمَنْزِلِ الْفَرَجِ وَمَنْ لِي بِمَنْزِلِ الْفَرَجِ وَمَنْ لِي بِمَنْزِلِ الْفَرَجِ

سورة الاسراء (الآية ٨٠)



ACKNOWLEDGEMENTS

I would like to express my deepest gratitude and appreciation to Professor Dr. Ibrahim El Mitwaly Samaha, Professor of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University, for his keen supervision, appreciable and wise guidance which have been of great help in presenting this work in a satisfactory level.

I have the great pleasure to thank Dr. Ahmed Ismail Abou Gabal, Lecturer of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University, who forwards many valuable suggestions.

CONTENTS

	Page
INTRODUCTION	1
THE AIM OF WORK	3
REVIEW OF LITERATURE	4
Primary sex ratio	4
Factors affecting sex ratio	7
Relationship of vaginitis to the sex of conceptuses	19
Relationship between some diseases associated with pregnancy and the sex of the developing fetus	20
Antenatal diagnosis of sex... ..	34
MATERIAL AND METHODS	41
RESULTS	43
DISCUSSION	64
ENGLISH SUMMARY	74
REFERENCES	76
ARABIC SUMMARY	

-oOo-

INTRODUCTION

INTRODUCTION

Some relations were mentioned between diseases associated with pregnancy and the sex of the developing fetus.

Mac-Gillivray et al., (1986) found an increase in male sex in cases of placenta praevia specifically in multipara while this was not noticed in controls.

Mac-Gillivray and Davey (1985) reported that there was no difference in fetal male:female ratio in women with preterm labour starting with contractions as compared with sex ratio in the total population. However, in women with spontaneous rupture of membranes there was a dramatic preponderance of boys over girls with ratio of 196:100.

Campbell et al., (1983) found that severe pre-eclampsia was not associated with an increase of any sex but cases of mild pre-eclampsia show preponderance of male babies.

An opposite observation was put in (1970) by Tiovanen and Hirvonen. They found that the male to female ratio increases as the severity of pre-eclampsia increases. It was 100:70 male to female in cases in which urinary output of protein is equal to or greater than 3 gm per 24 hours.

Kellokumpu-Lehtinen and Pelliniemi (1984) found a clear decrease in the male:female ratio with increasing duration of pregnancy (embryonic male:female ratio 164, fetal male:female ratio 111 - total 117). They showed that the higher mortality of male versus female conceptuses is restricted to the period of organogenesis.

THE AIM OF WORK

THE AIM OF WORK

The aim of work is to study the sex ratio in some diseases encountered during pregnancy. Also to study some factors that were mentioned to have an effect upon sex ratio.

REVIEW OF LITERATURE

PRIMARY SEX RATIO

The genetic sex-determining mechanism in the human provides for the production of two forms of male gametes, X and Y. Since theoretically, there should be as many Y-bearing as X-bearing sperm, the primary sex ratio, or the ratio at time of fertilization, should be 1:1 (Serr and Ismajovich, 1963).

Should the primary sex ratio not be equality, the underlying cause could be due to either unequal production of gametes or a differential participation in fertilization of two forms of gametes. Establishment of the primary sex ratio in man is at present impracticable, for it requires the recovery and assignment of zygotes that fail to cleave and blastocysts that fail to implant (Pritchard et al., 1985). Carr (1963) suggested that the primary sex ratio in human is unity.

Primary Sexual Development

Primary sexual development concerns, the arrangement of the sex chromosomes, the correct functioning of the testes - the presence of ovaries is not important - and the correct utilization of testosterone by the tissues of the external genitalia and the wolffian system (Lewhurst, 1986).

If one or more Y chromosomes is present in association with one or more Xs - XY, XXY, XYY, etc. - testes will form. The ability of the Y chromosome to determine testicular development is thought to be concerned with a plasma membrane protein called H-Y antigen which is believed to be the gene product of testis differentiating genes, normally situated near the centromere on the Y chromosome (Wachtel, 1981).

Once testes form they produce two substances - testosterone and Mullerian inhibitor; the testosterone masculinizes the external genitalia and the wolffian system and the Mullerian inhibitor prevents the development of primitive Mullerian structures which are always present and capable of development (Dewhurst, 1986).

This masculinization is dependent on the proper utilization of testosterone by the end organs in which at least two processes are concerned. One is the conversion of testosterone to dihydrotestosterone by 5-alpha reductase activity, an essential step for the tissues of the external genitalia which cannot utilize testosterone direct, but inessential for Wolffian tissues which can (Josso, 1981). A second mechanism concerns correct binding of dihydrotestosterone to receptors in the cytoplasm of the cell without which utilization cannot be achieved. By these

If one or more Y chromosomes is present in association with one or more Xs - XY, XXY, XYY, etc. - testes will form. The ability of the Y chromosome to determine testicular development is thought to be concerned with a plasma membrane protein called H-Y antigen which is believed to be the gene product of testis differentiating genes, normally situated near the centromere on the Y chromosome (Wachtel, 1981).

Once testes form they produce two substances - testosterone and Mullerian inhibitor; the testosterone masculinizes the external genitalia and the Wolffian system and the Mullerian inhibitor prevents the development of primitive Mullerian structures which are always present and capable of development (Dewhurst, 1986).

This masculinization is dependent on the proper utilization of testosterone by the end organs in which at least two processes are concerned. One is the conversion of testosterone to dihydrotestosterone by 5-alpha reductase activity, an essential step for the tissues of the external genitalia which cannot utilize testosterone direct, but inessential for Wolffian tissues which can (Josso, 1981). A second mechanism concerns correct binding of dihydrotestosterone to receptors in the cytoplasm of the cell without which utilization cannot be achieved. By these

processes then a male child is developed.

If the karyotype is 46XX or 47XXX, etc.- and no Y chromosome is present then ovaries form. Since the ovary produces neither testosterone nor Mullerian inhibitor, there is no masculinization and the uterus, vagina and tubes develop. It will be seen, however, that this is entirely a negative process (Dewhurst, 1986).

The Role of H-Y Antigen in Primary Sex Determination

Testicular organization, normally under the direction of the Y chromosome, is the function of the evolutionary conserved plasma membrane protein serologically detectable as H-Y antigen. Under specific circumstances, H-Y antigen may be expressed in the absence of the Y chromosome, thus producing XO and XX males. If H-Y antigen is not expressed, XY individuals develop as females (Ohno, 1978).