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**SEXUALLY TRANSMITTED DISEASES IN  
WOMEN ATTENDING FAMILY PLANNING  
CLINICS IN YAOUNDE - CAMEROON**

THESIS FOR MD PRESENTED AND DEFENDED  
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"They say that a man would be a fool to fold his hands and let himself starve to death. Perhaps so, but it is better to have only a little, with peace of mind, than to be busy all the time with both hands, trying to catch the wind" Eccl. 4:5-6.

"Go to the ant, you sluggard;  
consider its ways and be wise" Pro. 6:6

"To God be the Glory" (Gal. 1:4)

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**THE PHYSICIANS' OATH**  
(Declaration of Geneva)

*I solemnly pledge myself to consecrate my life to the service of humanity;*

*I will give to my teachers the respect and gratitude which is their due;*

*I will practise my profession with conscience and dignity;*

*The health of my patient will be my first consideration;*

*I will respect the secrets which are confided in me, even after the patient has died;*

*I will maintain by all means in my power, the honour and the noble traditions of the medical profession;*

*My colleagues will be my brothers;*

*I will not permit considerations of religion, nationality, race, party politics or social standing to intervene between my duty and my patient;*

*I will maintain the utmost respect for human life from the time of conception; even under threat, I will not use my medical knowledge contrary to the laws of humanity;*

*I make these promises solemnly, freely and upon my honour.*

# DEDICATION AND ACKNOWLEDGEMENTS

## DEDICATIONS

After a successful lifetime until this period of accomplishment of my dissertation, it will be very unjust for me not to dedicate this work to you:

1) The Almighty God

You gave me life, wisdom, knowledge, to accomplish this work. After all, for giving me the mother and father, brothers and sisters, friends and lecturers in my different schools until this point of my academic career. To you be the Glory.

2) My Darling Mother

You put me to earth, you followed me up from nakedness and illiteracy to well-dressed and literate individual. None of your efforts was spared to make me the individual you desired. Today, you are a great woman to have accomplished your dreams. To you I say the road is still long for me to be a man in the society. More grease to your elbow.

3) My Superb Dad

You both brought life into me, you stimulated my appetite for medicine; you followed me up until the accomplishment of your dream. You are a great man. Your relentless efforts will continue to yield good fruits. To you I say keep it up, only the Almighty can reward justly.

4) My Sweetheart

You spared no time, effort or skill to encourage, support and care throughout this delicate period of thesis writing. You have always proven your worth as a special partner. Your efforts did not go in vain because your sleepless nights also helped in the writing and compilation of this work. To you I say let us live long together to harvest the fruits we both cultivated.

5) My Brothers and Sisters

Eric Eko Battey	Linda Kong
Hugues Vinapon	Abong Sylvie
Kwedi Nsah	Nelly Laetia Nsah
Tabé Emma Eko	Emilie Nsah
Félicité Doo	

The warmth and passion as brothers and sister; the love and care; the years spent together; the prayers, the moral and psychological support given me throughout my academic career. To you I say we will always rejoice together.

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8) The Mbunya Family

\*Parents: You acted like my parents. You did just what a conscious and God-fearing man will want from someone; spiritual healing. You did all your best to make me comfortable physically and spiritually both in Yaounde or during my internship in Douala. I cannot reward you; I am not even worth rewarding you because as we all know, you did it because of the fear of God not man. He and only He will reward you either by Himself or through me. To you I say don't relent your efforts. Keep it up!

\*Children: You acted just like my brothers and sisters and far more than friends. You gave me warmth at all times; you comforted me in times of stress; you prayed for me in times of trouble and agony; you propelled me in times of academic or social barriers. I will not hesitate accepting you as part of my family (brothers and sisters alike).

9) My Grandmother (Paternal)

What can I say you did for me? They are so many that I cannot start listing them here. You did everything. You are a symbol of wisdom, charity and prosperity. You signify just what I aspire - loving and God fearing. To you I just ask that you continue in the same track for just that will be enough for anybody to consider you a mother.

10) My Beloved late Grandmother (Maternal)

I am representing what you worked for. You always wanted us to liberate your daughter, we regret your absence to see how and at what extend your granddaughters and grandsons have gone to liberate her. We just pray that wherever you are, you are happy for us and protecting us and finally taking care of the whole family and family in-laws. Thanks to God that you existed near us as grandmother.

11) My late Uncle and Brother

You two were the alpha of my life. You left me on this earth when I just started to know what life was. Today I am a man. I hope you are on the right side of our Lord and preparing a place for us.

12) My Uncles and Aunts

What an uncle or an aunt is to anyone is very special and unique. No one can replace an aunt or an uncle. You cared for me; you were very conscious about my education because you loved me and now the job is over. Hope you feel happier than I do. I dedicate this job to you because you followed me from day one until this last day.

13) My Cousins

Your position appear to be less privileged but I say no. You are as worthy as every group of person who aided me throughout my life until this point that I am leaving higher education. I strongly appreciate your efforts and hope that we remain together to celebrate this job well done. Thank you very much and don't stop because the road is still long and rough.

14) Everyone who cared

Your position is the last but not the least. Your aid is not negligible because all what you provided for me helped in one way or another to make me accomplish what we all planned. To you I say its not ended, continue let's attain higher heights by the grace of the Almighty.

I love you all.

- 9) **My Aunts and Uncles:** - Mr/Mrs Mahovi  
- Mr Tumnde Peter  
- Dr Njikam  
- Mr Ndembason Henri  
- Atang Elizabeth  
- Mr Ndoumbe Belle

You helped me in one way or another to accomplish this task. I say thanks very much.

10) **Mates of the 24th batch of FMBS**

It is not small to be together for seven years. You provided more than enough warmth to me.

11) **Staff of Government Primary School, Down Beach II (1978-1985)  
Government High School, Limbe (1985-1992)**

You built the foundation; you made me be what I represent now. Thanks very much

- 12) All those who in one way or another helped in the accomplishment of my higher education career and whose names do not feature in this work. You also did much. Excuse me for that.

I love and care for you all.

## ABBREVIATIONS

AIDS:	Acquired Immune Deficiency Syndrome
BP:	Blood Pressure
CIN:	Carcinoma in situ
CSF:	Cerebro Spinal Fluid
C/S:	Caesarean Section
EPC:	Eglise Pr�sbyterienne Camerounaise
FBC:	Full Blood Count
FSH:	Follicle Stimulating Hormone
Hb:	Haemoglobin
HIV:	Human Immunodeficiency Virus
IM:	Intramuscular
IUD:	Intra Uterine Device
IV:	Intravenous
LH:	Luteinizing Hormone
LMP:	Last Menstrual Period
MCHC:	Mother and Child Health Clinic
mm:	Millimetre
MU:	Million international Units
PID:	Pelvic Inflammatory Disease
PMI:	"Protection Maternelle et Infantile"
PR:	Pulse Rate
Q:	Temperature
RBC:	Red Blood Count
RR:	Respiratory Rate
STD:	Sexually Transmitted Disease
TPHA:	Treponema pallidum Hemagglutination Assay
UN:	United Nations
USA:	United States of America
VDRL:	Venereal Disease Research Laboratory
WBC:	White Blood Count
WHA:	World Health Assembly
WHO:	World Health Organisation

## DEFINITION OF TERMS IN THE TEXT

- Contraception:** All methods used to control conception whether natural or artificial
- STD:** All diseases principally or almost exclusively transmitted by sexual contact with genital and/or general manifestations
- Prevalence:** The proportion of the population who have a disease at one point in time
- Incidence:** The proportion of the population who get the disease over a period of time
- Relative Prevalence:** The ratio of the prevalence of an outcome in subjects classified by their level of a predictor variable
- Histogram:** An illustration which depicts the distribution of a single quantitative variable
- Pie chart (diagram):** Numbers are expressed in degree and depict the distribution of a single qualitative variable
- Bar chart (diagram):** An illustration which shows the relationship between two variables, usually one being quantitative and the other being qualitative or quantitative
- Quantitative variable:** Numerical quantities arising from counts or measurements which vary from one member of a sample to another e.g. height, age
- Qualitative variable:** Quality data arising when individuals may fall into separate classes or have no numerical relationship with one another at all e.g. sex. Also termed categorical variable
- Variable:** Quality or quantity which vary from one member of a sample to another.

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# SUMMARY

## Introduction

STDs are a major public health problem in the developing as well as developed world. Over 250 million new cases of curable STDs occur annually world wide, meanwhile 1 out of every 10 sexually active individual is infected by an STD. 40% of individuals of the reproductive age in Cameroon are exposed to at least 1 STD. Chlamydial infection has replaced gonococcal infection with highest prevalence in Cameroon and world wide. An average of 20% of women attending Family Planning, antenatal and other clinics in Africa has trichomonas. However, with the vulgarisation of Family Planning Clinics nation-wide and limited screening centres for STDs and AIDS, screening the risk population coming for family planning consultations will probably give us an idea of how prevalent STDs are in the risk population in these localities, if that is the case such clinics could serve as screening centres for STDs and AIDS. This study “STD prevalence in Family Planning Clinics” was based on these assumptions.

## Objectives

- 1) General: Determine the STD prevalence in women attending Family Planning Clinics.
- 2) Specific:
  - i) To determine the prevalence of gonorrhoea, chlamydia and other infections in women attending Family Planning Clinics;
  - ii) To determine the prevalence of HIV/AIDS among women attending Family Planning Clinics.

## Methods

This descriptive and prospective study with a sample size of 50 (from Lawrenz's fomular) ran from December 1997 to December 1998 and had as subjects, women of reproductive age attending the Family Planning Units below:

- Central PMI: Urban and cosmopolitan
- Cité Verte PMI: Many FP clients of all classes
- Djoungolo PMI: Mission hospital with many FP clients.

After fulfilling the administrative procedures in the health institutions, our study was carried out in two phases.

Firstly, all clients were seen, interrogated and examined. Those with signs of STDs/AIDS were sent to the laboratory and were given appointments to present their results.

Secondly, results from laboratory investigations were registered in the standard questionnaire of each client. Those with positive curable STDs were treated with indicated antibiotics, meanwhile those with positive untreatable STDs (AIDS) were referred to the blood transfusion centre of the Central Hospital for counselling.

### **Results:**

The results and analyses were as follows:

783 clients were seen altogether

113 (14.4%) exhibited signs of STDs and were sent to the laboratory

59 (52.2%) responded and 45 (76.3%) of those who responded had at least 1 STD.

Chlamydia was highly represented (28.9%) while gonorrhoea had 6.7% and HIV 8.9%.

27.6 years was our mean age population while the age group of 26-30 years was the group of highest representation.

54.9% of our population with at least an STD were married; 39.1% monogamously, while 39.1% were unmarried.

Pills were by far the commonest contraceptive choice of these women (86%) while condoms and spermicides were hardly ever used (1.02%).

### **Conclusion**

We therefore concluded that STDs remain high in our environment as has been evident in this study in Family Planning Clinics. We believe that screening on clients in FPCs will help reduce the rate and complications of STDs as well as AIDs in our community.

## **Recommendations**

We recommended at the end of this study that:

- 1) Seroepidemiological surveys of FPC attenders be carried out from time to time to ascertain the prevalence of STD in selected but representative populations and geographical locations.
- 2) Screening for STDs be put into practice as it is suppose to be in our FPCs.
- 3) Family Planning Clinics be furnished with suitable equipments to carry out proper screening of STDs in order to diagnose and treat early, hence reducing STDs, AIDS and its complications.
- 4) Our FPC staff be trained to be able to carry out all FP procedures like implants, IUDs, etc.
- 5) Education of our reproductive age group about STDs, HIV/AIDS and promote the use of condoms.

## RESUME

Les maladies sexuellement transmissibles sont un problème majeur de santé publique dans les pays en voie de développement ainsi que dans les pays développés.

Par an, plus de 250 millions de nouveaux cas des MST curables sont diagnostiquées, néanmoins 1 individu sexuellement actif sur 10 dans le monde entier est infecté par une MST. Au Cameroun 40% des individus a l'âge de procréer sont exposés à au moins une MST et l'infection à chlamydia a remplacé l'infection gonococcique avec une grande prévalence au Cameroun et dans le monde entier.

Un moyen de 20% des femmes fréquentant les Centres de Planning Familial, prénatal et autres en Afrique sont atteintes de trichomonas. Avec la vulgarisation des Centres de Planning Familial dans le pays et une limitation des centres de dépistage des MST et le SIDA, le dépistage de la population dans les Centres de Planning Familial peut probablement nous donner une idée sur les prévalences des MST/SIDA sur la population dans ces localités, au cas où ceci serait vrai ces centres serviraient de centres de dépistage MST/SIDA. Cette étude "STD prevalence in Family Planning Clinics" est axée sur cette base.

### **Objectives:**

- 1) **Général:** Déterminer la prévalence des MST/SIDA chez les femmes fréquentant les Centres de Planning Familial.
- 2) **Spécifique:**
  - i) Déterminer la prévalence de gonorrhée, chlamydia et autres infections parmi les femmes qui se fait consulter dans les Centre de Planning Familial;
  - ii) Déterminer la prévalence de VIH/SIDA parmi les femmes qui se fait consulter dans les Centres de Planning Familial.

### **Méthodes**

Cette étude descriptive et prospective avec un échantillon de taille de 50 (tiré de la formule de Lawrenz) s'étend de Décembre 1997 à Décembre 1998 et donc le choix portait sur les femmes en age de procréer fréquentant les Centres de Planning Familial suivants:

- PMI Central: Population urbain et cosmopolite.
- PMI Cité Verte: Affluence des clientes de toutes classes.
- PMI Djoungolo: Missionnaire et affluences des clientes.

Après accomplissement de la procédure administrative des centre hospitalier, notre étude portait sur deux phases:-

Tout d'abord, toutes les clientes ont été consultées, interrogées et examinées. Celles avec les signes de MST/SIDA étaient envoyées au laboratoire et un rendez-vous leur était donné pour présenter leurs résultats.

Ensuite, les résultats de laboratoire étaient enregistrés dans un questionnaire standard qui était pour chaque cliente. Celles avec les résultats positifs aux MST traitables étaient traitées avec les antibiotiques indiqués alors que celles avec les MST non traitables (SIDA) étaient référées au centre de SIDA à la banque de sang de l'Hôpital Central de Yaoundé pour conseil.

### **Résultats:**

Les résultats et analyses étaient les suivantes:

783 clientes au total étaient consultées.

113 (14.4%) présentaient les signes de MST et étaient envoyées au laboratoire pour analyse.

59 (52.2%) ont présentées leur résultats parmi lesquelles 45 (76.3%) étaient porteuses d'au moins un MST.

Le chlamydia était le plus diagnostiqué (28.9%), la gonorrhée représentait 6.7% et VIH 8.9%.

L'âge moyen était 27.6 ans alors que la tranche d'âge entre 26-30 ans était le groupe le plus représenté.

54.9% de notre population enregistrée, porteuses d'au moins une MST sont mariées, 39.1% avec régime monogamie alors que 39.1% sont célibataires.

La pilule était le contraceptif le plus utilisé (86%) alors que les condoms et spermicides n'étaient presque pas utilisés (1.02%).

### **Conclusion**

Nous concluons que les MST sont répandues dans notre milieu et en particulier dans les Centres de Planning Familial. Néanmoins, le dépistage de MST/SIDA des personnes fréquentant les Centres de Planning Familial réduirait les complications de MST et même de SIDA au sein de notre société.

## **Recommandations**

A la fin de cette étude nous avons fait les Recommandations suivantes:

1. Qu'une couverture seroepidemiologique sur les personnes fréquentant les Centres de Planning Familial soit faite de temps en temps afin de se rassurer de la prévalence de MST sur les population visées ainsi que représentatives et dans les régions géographiques;
2. Que le dépistage de MST soit mis en marche comme sa ce doit dans les Centres de Planning Familial;
3. Que les Centres de Planning Familial soient équipés des matériels appropriés pour le dépistage de MST afin de permettre le diagnostic et le traitement précoce d'où la réduction de MST/SIDA et leurs complications;
4. Que les personnels de Centre de Planning Familial soient formés adéquatement pour la bonne marche de toutes les taches du planning familial tel l'implant, le stérilet, etc.;
5. Que l'éducation de notre groupe (population) en âge de procréer sur les MST, VIH/SIDA et la promotion des usages des condoms soient bien faites.

# **CHAPTER ONE**



## **INTRODUCTION**

## CHAPTER ONE

### INTRODUCTION

#### 1. Introduction

Sexually Transmitted Diseases (STDs) stand as one of the outstanding health hazards in the community nowadays because of their multiplicity of forms. The sexual attitudes of many people today contribute enormously to increase the prevalence of STDs and AIDS.

There was the crave in the 80s to increase contraceptive prevalence and improve reproductive health world-wide. As the decade was closing, 500 million couples still had no access to fertility regulations and an estimated 250 million new cases of STD were diagnosed (1). In 1995, the World Health Organisation (WHO) estimated 330 million new cases of curable STDs per year, approximating 1 million per day (2). The WHO estimates that at least one sexually active individual out of ten is infected by an STD annually and that the STDs augment nine times the risk of the HIV transmission (3). HIV, on the other hand, is a potent factor for other STDs, hence with the HIV pandemic it is clear that there are people at risk for STDs all over the world. In urban areas it is more severe with one out of three sexually active individual of age 13-35 years exposed to risk of contracting an STD at any moment (3) with major impacts on women and children (new-born). However, control of STDs is now widely accepted as one of the major strategies of HIV prevention in developing countries.(4)

With the conception (stigma) that STD and AIDS are shameful illnesses or illnesses of immorality, patients shy away from consultations leading to chronicity and spread of the diseases. The spread is also favoured by socio-economic conditions or factors such as sexual promiscuity, poverty, level of education, parental care, absence of symptomatology.

There exists more than 20 STDs with the most common (current) in Africa and Cameroon in particular being *Chlamydia trachomatis*, *Neisseria gonorrhoea*, syphilis, *Trichomonas vaginalis*, *Gardnerella vaginalis*, *Candida albicans*, Chancroid, *Herpes genitalis* and HIV.

The reproductive age group which coincidentally is also the sexually active group is of high risk of STD infections which if not properly treated may end up in infertility. In a recent review a median of 20% of women attending family planning, antenatal or other clinics in Africa had trichomoniasis while a median prevalence in Asian studies was 11% (5). The sexually active group which is of high risk of STD infections is also exposed to undesirable pregnancy and hence criminal abortion. There exist approximately 30-50 million induced abortions annually and 60-80 million infertile couples (1). It was noted in Uganda that contraceptive knowledge is widespread even among women with no education but the level of use of barrier methods is low in comparison with knowledge and attitudes (6), hence the high prevalence of STDs and AIDS.

Even though there exist appropriate treatment for most of the STDs, but due to neglect, ignorance and taboos, complications resulting from these STDs are also well known and well described in this country. Centres that screen for these STDs are also very limited. However, family planning clinics have been expanded into rural areas and we believe that with the multiplicity of these clinics, they could serve as centres for STDs screening. To the best of our knowledge no particular study has been carried out on this topic in Cameroon hence the necessity for this work.

## CHAPTER TWO



### *PROBLEM IDENTIFICATION AND DEFINITION*

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## CHAPTER TWO

### PROBLEM IDENTIFICATION AND DEFINITION

#### 2. Problem Identification and Definition

STDs are caused by bacteria, viruses and fungi and are a major health hazard in the population today (3). Screening centres do exist in our urban areas for STDs but the patient turnover is low.

With the number of family planning services on the increase even in the rural areas, it would be rather appropriate too to use these centres for the screening of STDs. This will provide for early diagnosis and treatments hence limiting complications such as PIDs, sterility and cervical cancer and even death, spontaneous abortions, ectopic pregnancy (7). 55-85% of women with PID from STD origin become infertile, meanwhile PID increases the risk of ectopic pregnancies by 7-10 folds (7).

This screening will give us an idea of HIV infection and other STDs in the population and strategies for prevention may be developed. Family planning centres may then become alternate screening centres for STDs. It was found out that access to family planning clinics has strong effects on a woman's chances of being screened for STDs (8).

## CHAPTER THREE



### OBJECTIVES

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## CHAPTER THREE

### OBJECTIVES

#### 3. Objectives

##### Global:

To determine the STD prevalence in women attending family planning clinics.

##### Specific:

- 1) To determine the prevalence of gonorrhoea, syphilis, trichomonas and others among women attending family planning clinics;
- 2) To determine the prevalence of HIV infection and AIDS among women attending family planning clinics.

## CHAPTER FOUR



### REVIEW OF LITERATURE

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## CHAPTER FOUR

### REVIEW OF LITERATURE

#### A. General Consideration

The female reproductive organs are situated in the pelvic cavity.

The main organs of the reproductive system are the primary sex organs, the gonads, and the organs which play a supportive role in reproduction and are known as the accessory sex organs. The gonads are the organs which produce the reproductive cells, or gametes.

The female gonads are two ovaries, which are small organs situated one on each side of the pelvic cavity. As well as producing gametes, the ovaries also produce hormones that exert an influence on the accessory organs.

The accessory reproductive organs consist of a number of glands which produce secretions to nourish the gametes, and also a system of tubes, the genital ducts, which convey the gametes to the outside of the body. Together all these parts of the genital system make up the internal genital organs. The more superficially disposed parts of the genital system which are designed to permit the act of sexual intercourse by which sperms are deposited inside the female duct system are called the external genital organs.

The genital duct system consists of the two uterine tubes, the uterus and the vagina, and, in the non-pregnant woman they are situated mainly within the pelvis.

The pelvic cavity is partially divided into anterior and posterior compartments by a transversely disposed shelf made up of the uterus in the mid-line and the folds of peritoneum, called the broad ligaments, which extend laterally from each side of the uterus to the lateral pelvic wall. Each ovary is situated obliquely on the posterior aspect of its related broad ligament to which it is attached by a fold of peritoneum, the Mesovarium. The uterine tubes, lying in the free edge of each broad left, communicates laterally with the peritoneal cavity in the vicinity of the ovary. An ovum shed from the ovary is taken up in

the open end of the uterine tube and passes along it to enter the uterus. The uterus is a hollow muscular structure, lined by a glandular membrane, the endometrium. The upper part of the uterus is movable and is called the body; the intermediate constricted part is the isthmus; and the lower somewhat bulbous portion, called the cervix is anchored to the pelvic diaphragm and projects into the vagina (figure 1).

Figure 1

38.4 *Reproduction*

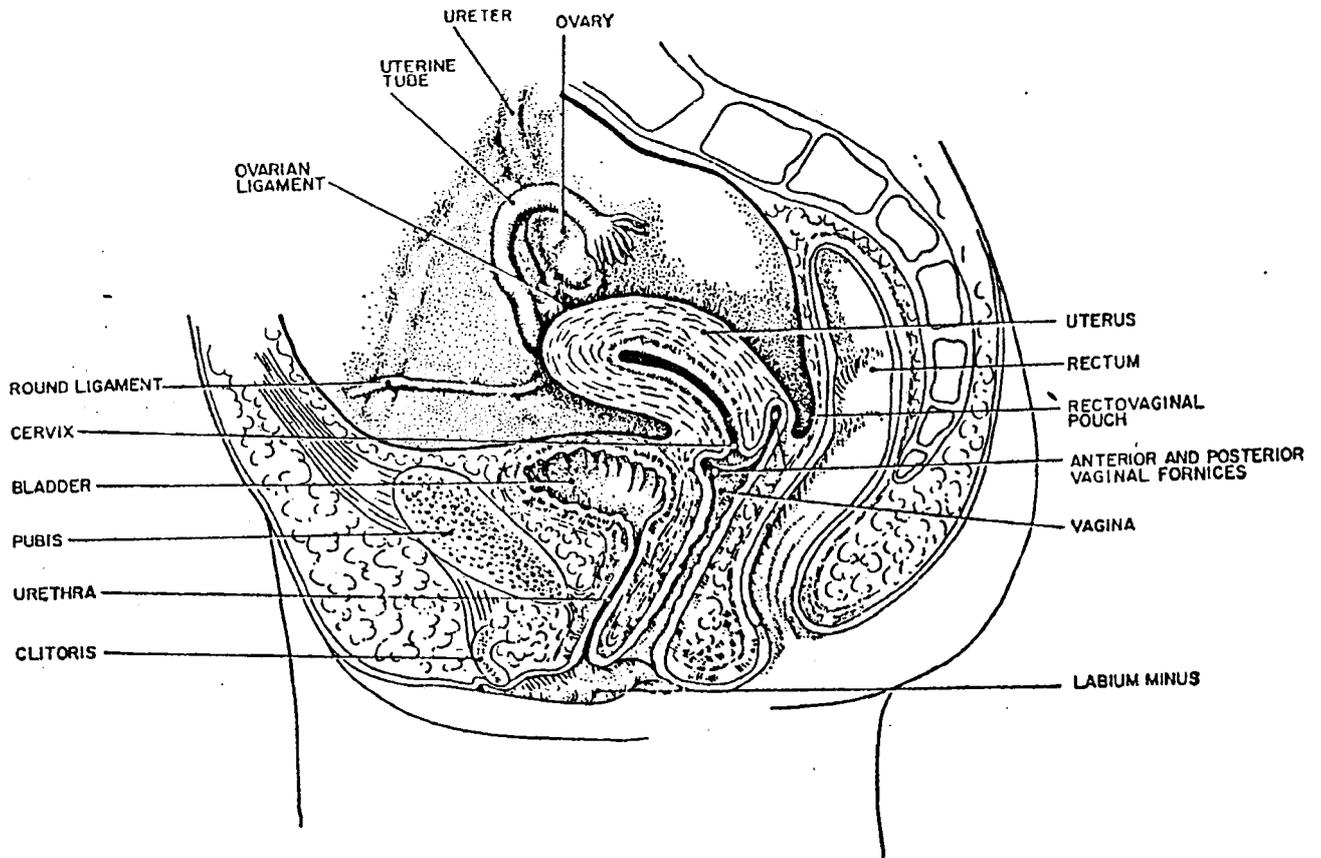


FIG. 38.5. Median sagittal section of the female pelvis.

The cavity of the uterus opens by way of the cervical canal into the upper part of the vagina, which runs downwards and forwards to reach the vestibule which is the lowest part of the vagina.

The external genital organs in the female are collectively called the vulva and these include the labia majora, the labia minora and the clitoris. The labia majora are two rounded folds that unite anteriorly to form a median elevation called the mons pubis. They enclose two inner folds, the labia minora, disposed on either side of the vestibule of the vagina and united anteriorly by a small mid-line structure, the clitoris. There are also many other glandular structures closely related to the accessory reproductive organs and they include the greater vestibule glands, the para-urethral glands of skene, and of course the mammary glands.

## **Particular Considerations of the Female Reproductive Organs**

### **4.1. Ovaries**

They are two in number and vary in size and appearance according to age and stage of the reproductive cycle. Each ovary in the young adult measures about 4 cm long, 2 cm wide and less than 1 cm thick (4 x 2 x 1).

The ovary is pinkish-gray in colour and its contours become irregular after puberty because of scarring from ovulation.

#### **4.1.1. Relations of the Ovary**

Each ovary is situated within the true pelvis, against its lateral wall, below the bifurcation of the common iliac artery called the fossa ovarica.

Each ovary is suspended from the posterior layer of the broad ligament by a double layer of peritoneum, the mesovarium, through which the vessels and nerves enter the gonad.

That portion of the broad ligament which extends from the upper pole of the ovary and the adjoining infundibulum of the uterine tube to the lateral wall of the pelvis is called the infundibulo-pelvic ligament. Through it the ovarian

vessels, lymphatics and nerves pass down to the mesovarium and in it there are muscle fibres, some of which are attached to the hilus of the ovary.

The lower pole of the ovary is less rounded than the upper and the fibromuscular ligaments of the ovary which lie within the broad ligament connects it to the uterus just below the region where the uterine tube joins the body of the uterus.

The fimbriated end of the uterine tube is closely related to the upper pole of the ovary with the fimbria ovarica being attached to the mesovarium border of the ovary by a fibromuscular strand.

#### 4.1.2. Vascular supply

The ovarian artery arises on each side from the front of the abdominal aorta just below the origin of the renal artery.

#### 4.2. Uterine Tubes

The 2 uterine tubes or fallopian tubes are ducts whose function is to convey an ovum from one of the two ovaries to the body of the uterus, and along which spermatozoa, deposited in the vagina during insemination, travel after passing through the uterine cavity. Fertilisation normally takes place within one of the tube near to its ovarian end.

Each tube is 10-12,5 cm long. Its outer part, the infundibulum is funnel-shaped and its lumen communicates with the peritoneal cavity through the ostium, an opening fringed with a varying number of finger-like processes called fimbriae. The part of the tube medial to the infundibulum is called the ampulla. This in turn is continuous with the medial third of the tube, the isthmus, which has a narrower bore. This is joint to the lateral and upper part of the uterine body. Its lumen then continue with the cavity of the uterus by the intra mural (interstitial or uterine) segment.

The uterine tube is vascularised by way of the uterine and ovarian arteries. Veins leaving the tube drain to the pampiniform plexus of the ovary and to the uterine veins.

Innervated by sympathetic and parasympathetic nerve fibres the sympathetic fibres are derived from the hypogastric plexus. The parasympathetic fibres are arranged such that the vasa fibres reach the lateral parts and the pelvic splanchnic fibres distributed mainly to the more medial parts.

### 4.3. Uterus

In an adult it can be described as being inverted pear-shaped. It consists of an upper expanded part, the body, an intermediate constricted region, the isthmus, and a lower cylindrical part, the cervix. The rounded part of the body, which projects above the attachments of the uterine tubes to the body of the uterus is called the fundus.

The uterus measures 7,5 cm long, 5 cm wide and 3-4 cm thick in a nulliparous woman. The cervix projects obliquely backwards into the anterior wall of the vagina and can therefore be described as having a supra vaginal and vaginal parts.

When a woman is in the upright position, and providing her bladder is empty, the body of the uterus is almost horizontal with the fundus pointing forward. Because of this orientation the uterus is described as being anteverted, anteflexed on itself at the isthmus.

Most of the substance of the uterine wall is the myometrium (thick muscular coat). The uterine mucosa is called the endometrium and it varies in thickness from 0,5 mm just after menstruation to 5 mm at the end of the uterine cycle. In the isthmus the endometrium is disposed more circularly and the constricted region of communication between it and the cervical canal is known as the internal os. The lumen of the cervix opens into the vagina by a narrow aperture known as the external os and bounded by two lips. Both lips

may be in contact with the posterior wall of the vagina. The space between the vault of the vagina and the anterior lip of the cervix is known as the anterior fornix and that behind the posterior lip as the posterior fornix.

#### 4.3.1. Supports of Uterus

The position of the uterus is maintained by a number of factors which are principally the muscular pelvic diaphragm with the associated pelvic fascia, and the fibromuscular (true) ligaments of the uterus. In addition, playing a second role and affording little support, there are peritoneal (false) ligaments.

##### 4.3.1.1. • Pelvic diaphragm

The pubococcygeus component of the levator ani muscles on each side pass just lateral to the vaginal wall to be inserted into the perineal body between the vagina and rectum. Some of the fibres of this muscle do not reach the perineal body but are inserted into the lateral and posterior vaginal wall. These muscles thus act as a supporting sling and a sphincter for the vagina, and so indirectly for the uterus and the bladder. If the pubococcygeus is stretched or torn during parturition, the vagina loses this support and tends to subside through the pelvic floor into the vestibule, carrying the uterus with it; this is known as prolapse.

It should also be appreciated that, in addition to the levator ani, the perineal muscles are inserted into the perineal body, consequently if they are torn or otherwise damaged, the perineal body ceases to be anchored properly and the levator ani loses its ability to function effectively as a support of the uterus.

##### 4.3.1.2. • Perineal body

Its importance to the integrity of the pelvic floor has just been stressed. It is a compact fibromuscular node in the median plane, 1,5 cm in front of the anal margin. Towards this node eight muscles converge and interlace - the

anterior fibres of the two levator ani muscles, the bulbospongiosus, the two superficial and deep transverse perineal and the sphincter ani externus muscles. The perineal body also receives longitudinal unstriated muscle fibres from the rectal ampulla and the anal muscle.

#### 4.3.1.3. • Fibromuscular ligaments

The uterine ligaments are fibrous condensations of pelvic fascia containing muscle fibres and in the vicinity of the uterus they blend with its musculature. They hypertrophy in pregnancy and involutes after parturition. They atrophy markedly at the end of the reproductive period of life (menopause).

The ligaments sling the cervix with the upper part of the vagina from the pelvic wall and, because of their attachment mainly to the cervix, it is relatively the most fixed part of the uterus. The ligaments of the uterus are defined as follows:

- 1) The pubocervical ligament connect the anterior aspect of the cervix to the posterior aspect of the pubis. They correspond to the median and lateral puboprostatic ligaments in the male.
  
- 2) The lateral or transverse cervical or cardinal ligaments connect the lateral aspect of the cervix and upper vaginal wall to the side wall of the pelvis. They consist of a dense condensation around the uterine vessels as they course from the internal iliac artery to reach the cervix. Close to the cervix, the uterine artery crosses the urethra which lies just below it and which is running forward to reach the bladder.
  
- 3) The uterosacral ligaments, which connects the cervix and the sacrum, are enclosed within the recto-uterine folds of peritoneum demarcating the lateral margins of the recto-uterine pouch. When a woman is upright these ligaments are disposed close to the vertical.

4) The round ligament connects the uterine body to the anterior abdominal wall and it is not clear to what extent they play a part in maintaining the normal position of the uterus; they may help to maintain the uterus in an anteflexed position. The round ligament is a fibromuscular cord extending from the front of the uterus, immediately below the tubo-uterine junction to the labius majus. At its point of attachment to the uterus it is continuous with the ligament of the ovary and from the uterus the round ligament passes laterally within the folds of the broad ligament to reach the side wall of the pelvis. From here it passes forwards and upwards across the obliterated umbilical artery and external iliac vessels to reach the deep inguinal ring when it hooks round lateral to the inferior epigastric artery to enter the inguinal canal.

Together with the ligaments of the ovary, the round ligament represents the remains of an embryological structure, constituting the gubernaculum testis in the male which is concerned with the descent of the gonad. A peritoneal extension, corresponding to the processus vaginalis and related to the gubernaculum, may sometimes persist after birth in the female; it is then referred to as the canal of Nück. Some striated muscle fibres from the abdominal musculature around the inguinal canal pass into the round ligament and may be regarded as the counterpart of the male cremaster muscle.

#### **4.3.1.4. • Peritoneal ligaments**

Peritoneum is reflected from the anterior surface of the uterus at about the level of the isthmus to the dome of the bladder. Peritoneum covers all the posterior surface of the uterus except for the posterior surface of the vaginal portion of the cervix. The lateral extension of the peritoneum covering the anterior and posterior uterine surfaces form lateral mesenteries attaching the lateral borders of the uterus to the pelvic wall. On each side, the mesenteries form a fold disposed in the coronal plane and known as the broad ligament. The uterine tubes are enclosed in its upper free margins and the ovary is attached to its posterior surface by the mesovarium. The part of the broad

hypogastric and pelvic plexuses. The details of the distribution of afferent fibres to the uterus are still ill defined.

#### 4.4. Vagina

It is a tubular organ, although usually the anterior and posterior walls are in apposition to one another to a considerable extent. It extends from the uterine cervix above to the vulva below, and opens to a space between the labia minora called the vestibule.

The vagina is about 7,5 cm long, but it should be noted that the anterior wall is shorter than the posterior. The vagina may be elongated during sexual intercourse.

The spaces between the cervix and the vagina vault constitute the fornices. The fornices are the widest part of the vagina, which is about 5 cm across.

Both the anterior and posterior walls are ridged in the mid-line by vaginal columns, also known as the anterior and posterior columnae rugarum. Between the vaginal columns the mucous membrane is thrown up into a series of horizontal folds called vaginal rugae.

In the virgin, the lower end of the vagina is partially closed by a thin annular fold of mucous membrane called the hymen.

The upper part of the posterior vaginal wall forms the anterior wall of the recto-uterine pouch of Douglas and is covered by peritoneum.

##### 4.4.1. Vascular Supply

The vagina is a very vascular organ. Its main supply is from the vaginal branch of the internal iliac artery, but it also receives branches from the uterine, middle rectal and internal pudendal vessels. These form a plexus around the organ with anterior and posterior mid-line vessels called the vaginal azygos arteries. The venous plexus drain through veins which accompany the vaginal arteries.

capillaries are dilated. Following ovulation, the stromal cells swell and there is more secretion from the glands (9, 10).

Towards the end of the 28-day cycle the stroma becomes even more vascular and oedematous, small haemorrhages and thrombi appear and the endometrium ultimately breaks down due to withdrawal of the hormonal support. Superficial layers of endometrium together with blood and leukocytes are shed and discharged - menstruation. Within a day or two the raw surface is healed over by epithelium proliferating from the basal portions of glands (9, 10).

- **Vaginal Changes** :

Proliferation and cornification of squamous epithelium then mucification of squamous epithelium and enlargement of nuclei with increase deposits of glycogen.

- **Cervical Changes** :

Considerable increase of secretion and gradual (progressive) opening.

- **Hormonal Changes** :

Inhibin produced by corpus luteum inhibits FSH. After 22nd day of cycle when corpus luteum becomes inactive follicular growth FSH secretion resumes. Peak of FSH is reached on 6th day of succeeding menstrual cycle and at this point the rising oestrogen has a negative feedback effect. A second peak is reached later on and at time of ovulation a sudden surge of LH levels is recorded coinciding with the 2nd peak of FSH inducing ovulation and corpus luteum formation.

The structural changes of the genital tract are enhanced by oestrogen from follicles and progesterone from corpus luteum then placenta.

## C. SEXUALLY TRANSMITTED DISEASES (STDs)

### I. Introduction :

Occupying the 5th position in morbidity, it is very frequently associated and hence resistant to antibiotherapy (11).

Discovered in 1836 by Donné, *Trichomonas Vaginalis* is the earliest organism to be discovered and later *Neisseric gonorrhoeae* by Neisse (1879) then later *Treponema pallidum* by Schandinn and Hoffman (1905) (12).

A 17% prevalence of gonorrhoea (13), 21% prevalence of syphilis serology (14), 30% trichomonas, 60% methritis due to chlamydia (14) have been reported. STDs can be prevented by oral contraceptives meanwhile they can be susceptible to moniliasis. Spermicides also have anti STD chemicals whereas IUD increases the risk of STDs and their complications (15).

Therefore FPC have to have treatment points for STDs because of the emotional and medical consequences of these STDs and also the increase risk due to certain contraceptive methods (16).

### II. Pathophysiology of STDS

The vulva, vagina and ectocervix under normal conditions are the habitats of various types of infective agents, but they are a threat only if normal defence mechanisms are altered (17, 10) (Fig. 2).

The defense mechanism include :

- **Vaginal acidity:** Vaginal epithelia produces glycogen which is converted to lactic acid by Doderlein's bacillus given a pH of 3-4. This pH inhibits most other organisms.
- **Thick layer of vaginal squamous epithelium:** This is a considerable physical barrier to infection. Continual desquamation of the superficial Keratohyalin layer and glycogen production both dependent of ovarian steroid action

### III. Clinical Presentation of STDs

STDs can be presented clinically in different forms. Some are symptomless while others present with one or more sign and symptoms. These signs and symptoms include:-

- vaginal discharge with the following characteristics
  - abundant
  - colour (white, brown, yellow, green, etc.)
  - itches
- genital ulceration
- genital itches with or without discharge
- lower abdominal pain
- genital (vulval) condylomas

### IV. **DIAGNOSIS OF STDs**

The diagnosis proposed by us of the common STDs concerning our study are as follows:-

⇒ **Gonorrhoea** : Prevalence rate of 10% in our clinics (18).

*Neisseria gonorrhoeae* is a gram-negative diplococcus that forms oxidase-positive colonies and ferment glucose. It is killed rapidly by drying, sunlight, heat and most disinfectants. It invades the columnar and transitional epithelium of the genitourinary tract and may enter the upper reproductive tract causing salpingitis with attendant complications. It has been estimated that 10-17% of women with gonorrhoea develop pelvic infection if untreated.

Most affected women are asymptomatic carriers  $\approx$  50%

#### Probable diagnostic criteria

- purulent vaginal discharge
- frequency and dysuria
- recovery of organism in selective media
- may progress to pelvic infection

- ◆ Darkfield microscopic findings positive
- ◆ Positive serologic test for syphilis

### **Secondary Syphilis:**

- ◆ Bilaterally symmetric papulosquamous eruption : condyloma latum, mucous patches
- ◆ Darkfield findings positive
- ◆ Positive serologic test for syphilis

### **Tertiary Syphilis:**

- ◆ Saccular aneurysm of the thoracic aorta
- ◆ Neurologic changes associated with degeneration of the posterior portion of the spinal cord.
- ◆ Spinal fluid negative
- ◆ Serologic reaction positive

### **⇒ Chlamydial Infections:**

Chlamydiae are obligate intracellular micro-organisms that have a cell wall similar to that of Gram-negative bacteria. They can be grown only by tissue culture. With the exception of the L serotype, Chlamydiae attaches only to columnar epithelium without deep tissue invasion. As a result of this characteristic, clinical infection may not be apparent. Infection by chlamydiae can be diagnosed using the following characteristics:

- Mucopurulent cervicitis
- Salpingitis
- Urethral syndrome
- Lymphogranuloma venerum
- Positive tissue culture
- Giemsa stain is approximately 40% accurate in adult genital infection
- Serologic methods are not totally accurate because 20-40% of sexually active women have positive antibodies titre.

### ⇒ **Trichomonas Vaginitis:**

*Trichomonas vaginalis* is a flagellated anaerobic protozoon that is frequently found in the vaginal flora of asymptomatic sexually active women. It is a common cause of irritant vaginal discharge. It is transmitted mainly during sexual intercourse but can be acquired from infected articles such as contaminated speculum or even a lavatory seat. It multiplies by binary fusion and feeds by osmosis and phagocytosis. It accounts for 20-25% of vulvovaginitis occupies the 3rd position of vaginitis and can be diagnosed using the following criteria:-

- ◆ acute phase:
  - vaginal tenderness and pain
  - irritant discharge
  - patchy strawberry vaginitis
  - copious offensive, frothy discharge
- ◆ frequently there is:
  - burning sensation
  - pruritis
  - dysuria
  - dyspareunia
- ◆ latent phase: - asymptomatic but presence of organism can be demonstrated often in a cervical smear.

### ⇒ **Gardnerella Vaginitis:**

*Gardnerella vaginalis* is a small, non motile, non encapsulated, pleomorphic rod that stains variably with Gram's stain. For a long time a large number of cases of vaginitis were labelled non-specific because of disagreement regarding the infective agent. These cases were characterised by a non-irritating foul smelling discharge. Ultimately, careful bacteriological studies have established the fact that although the discharge contains a mixture of bacteria, the one constant feature in 90% of cases was the presence of a tiny gram-negative cocco-bacillus which was a facultative anaerobe-G-vaginalis. It can be diagnosed as follows:

- presence of fowl smelling discharge
- the discharge is greyish and sometimes shows bubbles
- Gram staining is usually negative but can be variable
- some patients may have pruritis, frequency, dysuria, dyspareunia.

#### ⇒ **Candida Albicans:**

This is yeast and exist in two forms - slender branching hyphae or as a small globular spore which multiplies by budding.

The organism may exist as a normal commensal in the rectum and small numbers may be found in the vagina, the acid medium suiting their survival without symptoms arising. Symptomatic infection is most likely to arise when there are predisposing conditions such as pregnancy, immunosuppressive therapy, glycosuria, antibiotic therapy and chronic anemia.

Diagnostic criteria are as follows:-

- 20-40 years of age when oestrogen support of glycogen level is at its highest
- Irritant discharge, curdling
- dyspareunia
- inflamed and tender vagina and vulva on examination
- white patches resembling curdled milk and its removal reveals a red inflamed area. Symptoms after menopause tend to be severe.

#### ⇒ **Herpes Genitalis:**

The virus may affect the lower genital tract or the mouth. It is highly infectious - 80% of women in contact with male carriers become infected. The symptoms are severe. There may be recurring attacks every 3 or 4 weeks and they represent a potential for wide dissemination to others in the immediate environment. The virus has two varieties - 1 and 2 with a short incubation period of 3 to 7 days.

The diagnosis is made from - the appearance of the vesicles and ulcers  
 - examining cervical and vaginal smear:  
 large cells and sometimes multi-nucleated giant cells the nuclei of which contains eosinophilic inclusion bodies.

### ⇒ Acquired Immune Deficiency Syndrome (AIDS)

AIDS is now the most serious of all gynaecological infections. It has reached pandemic proportions affecting almost all countries and regions. In some parts of the world such as the Sub-Saharan region of Africa and in some sections of the public in western countries, e.g. drug addicts in the USA, there are epidemics. It is due to the Human Immunodeficiency Virus (HIV) or, in scientific terms, retrovirus oncornavirus.

It is difficult to provide an adequate description of this disease. The symptomatology is such that almost every organ may appear to be affected at one time or another. There is a mixture of constitutional disease with fever, sweating, etc. Neurologic symptoms and lesions, malignant tumours, liver and renal failure, secondary infections.

The course of the disease is erratic, associated with progressive loss of immune resistance. Death is almost inevitable but may be delayed for years.

## V. TREATMENT OF COMMON STDs

Treatment depends on the STD in question and might be curative and/or preventive.

### ⇒ Gonorrhoea

**Prevention:** Gonorrhoea is a reportable disease that can only be controlled by detecting the asymptomatic carrier and treating her and her sexual partner(s)

All high-risk population should be screened by routine cultures.

**Treatment:** Respond to three objectives

- \* rapidly sterilise the patient with effective antibiotics
- \* treat partner(s)
- \* treat other associated STDs

The used products include:-

Penicillin: 2.4 million bipenicillin in 2 injections 1M after 1g of probenecide oral tablets delays peni elimination.

Phenicoles

Spectinomycine

Cephatosprine 3rd generation (cetriaixon) Cyclines, Macrolids

**Conclusion:** Treatment of gonorrhoea responds to three objectives

- \* sterilise rapidly the patient
- \* treat partner(s)
- \* treat other STDs

These objectives have to be systematic in the treatment of STDs.

**Complications:** Major complication is salpingitis and its consequences (pelvi-peri peritonitis or generalised peritonitis, prolonged adynamicileus, severe pelvic cellulitis with thrombophlebitis, abscess formation with adnexal obstruction, etc.).

Asymptomatic gonorrhoea may result in disseminated infection with bacteremia that usually causes arthritis and dermititis.N. gonorrhoeae may cause meningitis or endocarditis. Infertility may result.

⇒ Syphilis

**Prevention:** If the patient is known to have been exposed to syphilis, do not wait for the disease to develop to the clinical or reactive serologic stage before giving preventive treatment. Even so, every effort should be made to reach a diagnosis, including a complete physical examination, before administering

preventive treatment. Syphilis is still a serious public health problem. Teaching young people about the disease and its consequences is still the best method of control. Use of a condom, together with soap and water decontamination after coitus, would prevent most cases.

If a lesion develops, a physician should be notified at once. All expose persons must be sought out and treated and the case reported to the communicable disease service in your city.

**Treatment:** Depends on the state and stage of the disease - Early syphilis (primary, secondary and latent of < 1 year)

- \* Benzathine peni 2.4 MU deep 1M injection (single cure)

- \* prolonged cure : Sodium penicillin 1 MU 1M x 15 days

Corticotherapy of 1st three days (20 mg/day) might be necessary.

- \* If known allergy to peni, use - Erythro 2g x 15 days

- Tetracycline 2g/j x 15 days

Late syphilis (latent nervous CSF<sup>⊕</sup>)

- \* Benzathine peni 2.4 MU/day x 3-6 weeks 1M

- \* Tetracycline 2g x 30 days

- \* Erythro 2g x 30 days

Nervous syphilis with clinical manifestation

- \* Aqueous peni G 1.2 MU - 2.4 MU I.V/day x 10 days in hospital milieu.

Person who had sexual contact with a syphilis carrier must be treated systematically with 2.4 MU of benzathine penicillin 1M.

**Conclusion:** The therapeutic treatment of syphilis no matter the stage is now perfectly clear. Just like in all other STDs, the partner(s) are also treated and other associated STDs looked for and treated if positive.

- Complications:**
- Nervous (cerebrospinal)
  - Cardiovascular
  - Congenital

### ⇒ Chlamydia

**Prevention:** Chlamydia is largely asymptomatic hence screening risk group and treating those positive will be the major preventive measure.

It is very important to screen and treat risk groups because of the consequences of retarded chlamydial infection.

**Treatment:** In most cases, chlamydia can be eradicated from the cervix by tetracycline 500 mg x 4/day orally or Doxycycline 100 mg x 2/day for a minimum of 7 days. When Tetracyclines are contraindicated or not tolerated, Erythromycin 500 mg x 4/day per os should be given for a minimum of 7 days. Given high doses of Ampicilline has resulted in the elimination of *C. trachomatis* from the cervices of women with acute salpingitis (19, 20).

**Complications:** Adverse sequelae of salpingitis, specifically infertility due to tubal obstruction and ectopic pregnancy are the most dire complications of these infections. Pregnant women with cervical chlamydia infection can transmit infections to their newborns; there is evidence that up to 50% of infants born to such mothers will have inclusion conjunctivitis and other neonatal infections.

### ⇒ Trichomonitis

Vaginitis by trichomonas occupies the 3rd position after gonococcus and mycoses and attacks 18% of the female population. Two drugs are particularly effective and in current use.

**Treatment:** Metronidazole 1g daily for 10 days for males and also local treatment 1 pessary/evening x 10 days for females.

Tinidazole 2g/day x 3 days with local introduction of pessary (atrican or flagyl) in females.

For pregnant women local treatment alone is maintained until after delivery.

Treat partner(s)

**Complication:** T. vaginalis is commonly associated with gonorrhoea, and has an association with cervical dysplasia. No cause-and-effect relationship has been proved.

⇒ **Gardnerella**

**Treatment:** Oral Metronidazole 200 mg x 3/day for 7 days or a single dose of 2g appears to be effective.

Treat male partner(s) also

⇒ **Candida Albicans**

It constitutes the second largest cause of vaginitis. The treatment is after all local.

**Preventive measures involve:**

- avoiding tight wears
- acid bathing soap
- synthetic inner wears

**Products used for treatment are:**

Tinidazole derivatives and also Nystatin for about 3 weeks  
The partner(s) must be treated.

### ⇒ Herpes genitalis

The type 2 virus is responsible for the genital manifestation of Herpes. It is nervous and hematogenous and gives the major new-born herpetic infections and even meningitis in adults. Its oncogenic power in the determination of cervical cancer is probable.

The acute local symptoms can be alleviated by applying ice for 20-30 minutes. Similarly, nonsteroidal soothing creams may be used. Analgesics such as 2% lignocaine can be employed. Repeated application of Acyclovir 3% as an ointment provides effective treatment but only if started at the onset of signs or symptoms. Oral acyclovir may be given in doses of 200 mg 4 hourly for 5 days. It inhibits proliferation of viral DNA without damaging host cells. Silver nitrate 10% may be applied to the ulcers and Betadine can be used to control secondary infections.

### ⇒ Acquired Immune Deficiency Syndrome (AIDS)

**Prevention:** Detect those affected.

Screening should be done when other STDs are detected

Those infected - systematic wearing of a preservative

- no blood donation
- inform the medical personnel
- avoid intercurrent infections and vaccinations with weakened virus.

**Treatment:** Earlier form of treatment were aimed at preventing and treating secondary infections in the final phases of the disease. They were directed especially at pneumonia due to pneumocystic carinii which is common in these patients and, if untreated, causes death within 1 year.

Four methods of treating or preventing the viral infections itself are in various stages of development:

♦ **Antiviral drugs :**

Zidovudine and didoxynosine are two such. The latter has a disadvantage in that diabetes mellitus and Raynaud's Syndrome have occurred during therapy.

♦ **Gene therapy :**

An altered virus, a so-called minor image of the AIDS virus has been constructed. The apparent idea is that the individual will be 'infected' with the artificial virus which will then occupy the viral receptors on T lymphocytes, thus preventing entry of the AIDS virus and protecting the immune system.

♦ **Vaccination :**

It is obviously impossible to use whole AIDS antigens for vaccination for fear of actually infecting the individual. Sub-units of the antigen have been used and there are indications of some success but, unfortunately, while treatment may protect against systemic infections this is no protection against the mucosal invasion during sexual activity. There is also evidence that the antigenic sub-units can vary and so also does the degree of immunity.

- ♦ There are benzodiazepine derivatives which interfere with reverse transcriptase reaction and would therefore stop the replication process.

**Conclusion :** AIDS remains a pandemic, individual and generally.

While waiting for the discovery of a vaccine or an effective treatment which is well tolerated, prevention remains the best method of eradicating this pandemic.

## VI. CONTRACEPTION

### Introduction

The practice of birth control (contraception) may be desirable for many reasons, including medical contraindication, a personal desire to have no children, no children yet, or no more children, and the global problem of increasing populations.

It took a very long time for man to reach the first billion individuals inhabiting the earth, sometime in the early part of the 19th century. Some 150.000 to 200.000 years if the analysis is restricted to homosapiens, but some 2 million years if homoerectus is considered, or even more than 4 million years if we go back to homohabilis. Even when Jesus Christ was born, 1998 years ago, world population was less than 300 million. It took some 1500 years to double this number, (around the time of the last two voyages of Columbus to America). The beginning of the 19th century signalled the one billion landmark and the second billion was already reached in 1927. Then it took less than 50 years to double this number to 4 billion by 1976 and the fifth billion was reached 11 years latter in 1987 (21).

There were, however, a number of indicators of time progress related to gradual awakening of the international community.

In 1962 assistance offer, upon request, to governments of developing countries with demographic and statistical studies (22).

In 1965 WHA requested the Director General of WHO to develop a programme on "fertility control method and health aspect of population dynamics" (23).

In 1968 in Teheran with proclamation by UN of the statement that information on and access to family planning as basic human rights (24).

In 1972, establishment of the WHO Special Research Programme, Development and Research Training in Human Reproduction (25).

In 1974-78 the Bucharest Conference resulted in the world population plan of action, underlying that "All couples and individuals have the basic right

to decide freely and responsibly the number and spacing of their children and to have the information, education and means to do so".

The Alma-Ata Declaration affirmed that family planning is a basic component of primary health care (26, 27).

International awakening was associated with an impressive increase in the number of governments supporting family planning. In the early sixties, only seven governments provided family planning services, whereas in the early eighties, over 120 governments supported such programme (28). By the year 1998, out of the 170 member states of the UN, 122 governments provided direct support to family planning, 24 governments indirect support and 18 governments provided no support; access to fertility regulation was limited in six countries (29).

**Table 1: Estimates of contraceptive prevalence in developing countries by region (United Nations 1989)**

Region	% of married population of reproductive age using contraception		
	1960-1965	1980/81	1983
All developing countries	9	38	45
Africa	5	11	14
East Asia (excluding Japan)	13	69	74
South Asia & Oceania,	7	24	34
Latin America <sup>a</sup>	14	43	56

(a) excluding Australia and New Zealand

It is firmly convinced that contraceptive prevalence represents the key not only to improved demographic and economic health, but also to reproductive and environmental health. In this context, contraceptive prevalence rate is defined as the percentage of women of reproductive age who are using any form of contraception with a medium prevalence at 51%.

**Methods**

The available methods of contraception may be classified in different ways, two of which are:

1) **"folk" methods:** coitus interruptus, postcoital douche prolongation of lactation

**"traditional" methods:** condom, vaginal diaphragm, spermicides (foam, creams, gels), and rhythm

**"modern" methods:** oral contraceptives, repeated injections of gestational steroids, IUD, surgical sterilisation.

2) **Barrier methods:** Diaphragm, cervical cap, condom

**Hormonal methods:** a) oral contraceptives (combines oestrogen and progestogen, progestogen only)

b) depot progestogen (injections, subcutaneous silicon implants)

c) vaginal (silicon rings releasing oestrogen and progestogen).

**IUD:** inert, copper bearing, progestogen releasing

**Natural methods:** rhythm or billings, breastfeeding, coitus interruptus

**Spermicides:** creams, films, foams, jellies, pessaries, sponges, all of mainly Nonoxynol based

**Surgical methods:** a) a paroscopic sterilisation (rings, clips, bipolar diathermy)

b) tubal ligation

**Immunisation methods:** these are still at an investigative stage.

# CHAPTER FIVE

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## METHODOLOGY

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## CHAPTER FIVE

### METHODOLOGY

#### 5.1. Study Design:

It was a descriptive study

#### 5.2. Duration of Study:

The study ran from December 1997 through December 1998.

#### 5.3. Study setting:

##### 5.3.1. Central PMI

An autonomous Health Centre

Situated adjacent to the Yaounde Central Hospital in the Yaounde 1st District; Mfoundi subdivision in the Centre Province.

##### 5.3.1. 1. Infrastructure :

Being an autonomous Health Centre, it possesses curative and preventive blocks, a pharmacy and a laboratory. The preventive block possesses a prenatal consultation, vaccination, family planning unit.

##### 5.3.1.2. Personnel :

5 medical practitioners, State registered nurses, midwives, nurse aids, etc..

##### 5.3.1.3. Reasons for choice :

- Reception capacity of the target population in the family planning unit
- Different social groups concerned
- Competence of their personnel in this domain and hence acting as a reference in family planning
- Proximity to Central Maternity, base of directors of this work
- Proximity to laboratory chosen, "Centre Pasteur"

### **5.3.2. EPC Djoungolo :**

A presbyterian mission hospital situated at Djoungolo, a small neighbourhood in Yaounde near the Nlongkak quarters.

#### **5.3.2.1. Infrastructure :**

A big hospital with the following :

- an equipped PMI
- different medical services (internal medicine, gynecology, pediatrics and surgery) with a theatre
- a pharmacy and a laboratory
- an ophthalmology service

#### **5.3.2.2. Personnel :**

- 4 medical doctors
- superior and State diploma nurses, breveté nurses
- other personnel

#### **5.3.2.3. Reasons for choice :**

- One of the biggest non-governmental hospital with developed PMI and nearest to "Centre Pasteur"
- Affluence of clients in its PMI unit
- To get population who dislike government hospitals

### **5.3.3. Cité Verte District Hospital :**

A district hospital in the neighbourhood of Cité Verte in Yaounde opposite the "F Block" of the SIC buildings.

#### **5.3.3.1. Infrastructure :**

- Mother and child care unit
- Wards for pediatrics, post partum, and internal medicine patients

- Laboratory and a pharmacy
- Anti-diabetic and hypertensive Centre
- Office of the District Medical Officer

#### 5.3.3.2. Personnel :

- 3 permanent doctors and some part-time doctors
- Nurses of different categories
- Other medical and paramedical personnel

#### 5.3.3.3. Reasons for choice :

- middle-class target
- district hospital with cooperative personnel
- many family planning clients

#### 5.4. Sample size:

LAWRENZ'S formula for calculating sample size for a descriptive study is :

$$n = \frac{p(1-p)(z\alpha)^2}{d}$$

where p = prevalence of the disease to be studied in present day

d = degree of precision

n = sample size

$z\alpha$  = constant

$\alpha$  = type one error

Previous studies showed that the general prevalence of STDs in Yaounde population is 40% (31)

$$p = 40\% = 0.4$$

Our confidence interval was estimated to be 95% (0.95).

$$1-\alpha = 0.95$$

$$\alpha = 1-0.95 = 0.05$$

From epidemiology table  $z_{\alpha} = 1.96$

We wanted that the value calculated approximates 10% of the expected value

$$d = 0.1$$

Substituting in formula and computerising

$$n = \frac{0.4(1-0.4)(1.96)^2}{0.1} = 50$$

### **5.5. Subjects:**

The population (subjects) included all females of reproductive age soliciting family planning methods and possessing risk factors for STDs. To be accepted, subjects conformed to-

#### **5.5.1. Inclusion criteria which were:**

- 1) consent to participate
- 2) capability to do the STD screening tests
- 3) acceptance to carry out HIV screening test
- 4) women of reproductive age who accept to participate in the study

#### **5.5.2. Exclusion criteria were:**

- 1) women who did not give consent
- 2) loss to follow-up cases

## 5.6. Material and Procedure :

### 5.6.1. Procedure :

We personally participated in family planning consultations in the study setting.

At the Central PMI - Mondays, Thursdays and Fridays

At the EPC Djoungolo - Tuesdays

At the Cité Verte Hospital - Wednesdays

All clients were screened and those presenting with risk factors for STDs (multiple partners, recent change of partner, vaginal discharge, pruritis, IUD, genital ulceration, secondary infertility, etc.) were explained the study and those willing to participate either signed or gave their verbal consent. Those who complied were sent to "Centre Pasteur" for STD/AIDS test after filling a simple questionnaire with information from interrogation, clinical evaluation. The results of the screening test were then added in the questionnaire and kept anonymous. Those who failed to bring their results were considered lost to follow-up cases and were excluded from the study.

In our absence, the cases seen by the personnel in charge were given rendez-vous the day we were suppose to be in the centre concerned or those with results were asked to leave them behind and come on the day we were suppose to be present.

Positive results for treatable STDs were treated with indicated antibiotics, antiparasites and positive results for untreatable STDs (AIDS) were referred to the blood transfusion centre in the Yaounde Central Hospital for counselling.

### 5.6.2. Material :

materials used to carry out the study included:

- questionnaire
- pen
- pencil

- paper
- ruler
- stethoscope
- sphygmomanometer
- weighing balance
- gloves
- speculum

## **5.7. DATA COLLECTION AND ANALYSIS**

### **5.7.1. Data collection:**

Data was collected using a standard questionnaire through personal interviews, clinical examination and paraclinical investigations. The questionnaire was standard and carried the following information -

- personal information of patients (identification)
- antecedent histories
- findings on clinical examination
- laboratory results

Filling of these questionnaires was done by ourselves and information kept anonymous.

### **5.7.2. Data analysis:**

Data was analysed using simple descriptive statistical tables, illustrations and graphs to calculate mean, mode and standard deviations.

## CHAPTER SIX



## RESULTS

## CHAPTER SIX

### RESULTS

At the end of the study we were able to come out with the following results:-

Total number of clients seen = 783

Number of clients who exhibited risk factors for STDs = 113 (14.4%)

Number of clients referred to the laboratory for STD screening = 113 (14.4%)

Number of clients who responded = 59

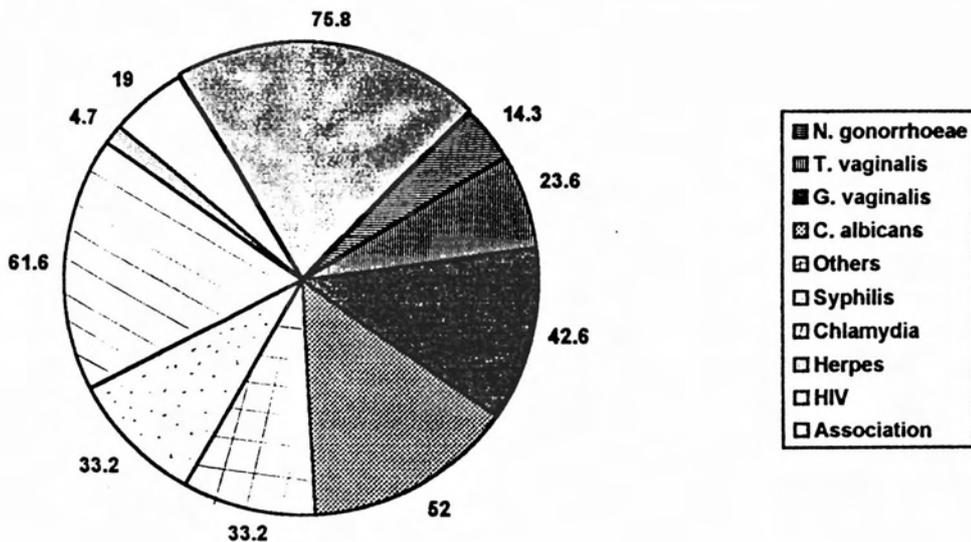
Hence percentage response = 52.2%

Number of clients with at least one positive STD from those who responded  
= 45 (76.3%)

**Table 6.1: Frequency Distribution of Organisms Isolated**

Organisms	Frequency	Relative frequency (%)
Chlamydia	13	28.9
Candida albicans	11	24.4
Gardnerella vaginalis	9	20
Syphilis	7	15.6
Others	7	15.6
Trichomonas vaginalis	5	11.1
HIV	4	8.9
Neisseria gonorrhoea	3	6.7
Herpes	1	2.2
Association of organisms	16	35.6

Chlamydia showed highest prevalence (28.9%) followed by Candida (24.4%) and Gardnerella vaginalis (20%). Association of organisms produced a prevalence of 35.6%.



**Figure 4: Pie chart of Organisms isolated from vaginal smear and serology**

**Table 6.2: Reports of prevalence of STD in Family Planning Clinics in Africa**

Country	Culture %	Serology %	Reference
<b><u>Gonorrhoea</u></b>			
Swaziland	2		32
Nigeria - Zaria	3		33
Ibadan	5		34
South Africa	10		35
Kenya	17.5		36
Ethiopia		66 (titre $\geq$ 1/40)	37
Côte d'Ivoire		31 (titre $\geq$ 1/320)	4
Tanzania		3.7 <sup>a</sup>	38
Cameroon		6.7 <sup>a</sup>	present study
Uganda		17	13
<b><u>Genital Chlamydia</u></b>			
South Africa	16		39
Ethiopia		64	
		47 (IqT $\geq$ 1/64 and/or IqM $\geq$ 1/8)	37
Côte d'Ivoire		5.5	4
Cameroon		29	present study
<b><u>Genital Herpes</u></b>			
Ethiopia		41	37
Cameroon		21 (titre $\geq$ 1/128)	
		2.2	present study
<b><u>Syphilis</u></b>			
	VDRL	FTA/TPHA	
Swaziland	6		32
Nigeria - Zaria	18		33
Ibadan	28		
Ethiopia	28	39	37
Côte d'Ivoire		1.1	4
Cameroon		15.6	present study
<b><u>Trichomoniasis</u></b>			
	wet pre/culture	pap smear <sup>a</sup>	
Swaziland	15		32
Nigeria-Zaria	5		33
Tanzania		14.3	38
Ethiopia		9	37
Cameroon		11	present study
Côte d'Ivoire		13.2	4
<b><u>HIV</u></b>			
Cameroon		9	Present study
Kenya		2	36
Zaire		7	40
Côte d'Ivoire		16.2	40
Uganda		14	40

a = Pap Smear: Cervical cytology smear stained with Papanicolau stain

**Table 6.3: Distribution of Marital Status of Clients who Exhibit Risk Factors of STDs**

<b>Total</b>	<b>Frequency</b>	<b>Relative frequency (%)</b>
<b>Marital Status</b>		
Married - Polygamy	26	23.0
- Monogamy	36	31.9
Widow	-	-
Single / Unmarried	36	31.9
Others (fiancé, divorced)	9	8.0
Unknown	6	5.3

54.9% of the clients were married of which 31.9% were of monogamous couples. 39.1% of our clients were unmarried.

**Table 6.4: Distribution of Positive Clients by Marital Status Relative to those who exhibited risk factors**

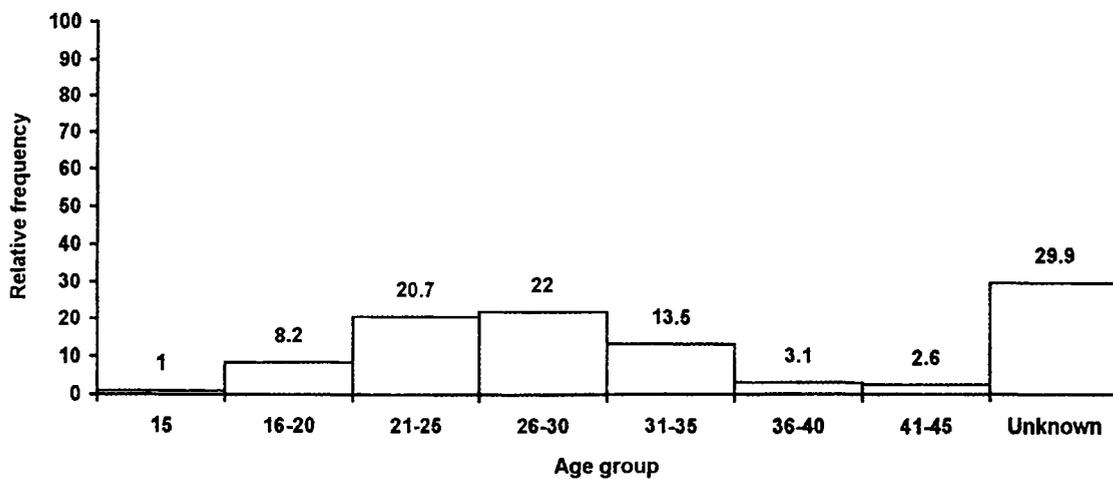
<b>Marital Status</b>	<b>Frequency</b>	<b>Percentage frequency of Positive results</b>
Married	16	25.8
Unmarried	21	58.3
Divorced / Fiancé	-	-
Widowed	-	-
Unknown	8	66.7

58.3% of the available and positive results were entirely for unmarried women meanwhile 25.8% were of the married couples.

**Table 6.5: Age Distribution of Clients**

Age (X)	Frequency (f)	Relative frequency (%)
≤ 15	1	0.1
16-20	64	8.2
21-25	162	20.7
26-30	172	22
31-35	106	13.5
36-40	24	3.1
41-45	20	2.6
> 45	-	-
Not registered (unknown)	234	29.9

- 1) Mean = 27.6
- 2) Age group highly represented = 26-30 years
- 3) Median = 27

**Figure 5 : Histogram showing age distribution of Clients**

21-30 years was the high prevalence age group for contraceptive use.

**Table 6.6: Age Distribution of Clients with Positive Results**

Age	No. at Risk	No. with result positive available results w.r.t.
≤ 15	-	-
16-20	15(13.3)	8(13.6)
21-25	40(35.4)	23(39)
26-30	30(26.5)	16(27.1)
31-35	15(13.3)	8(13.6)
36-40	7(6.2)	4( 7)
41-45	-	-
≥45	-	-
Unknown	6(5.3)	-

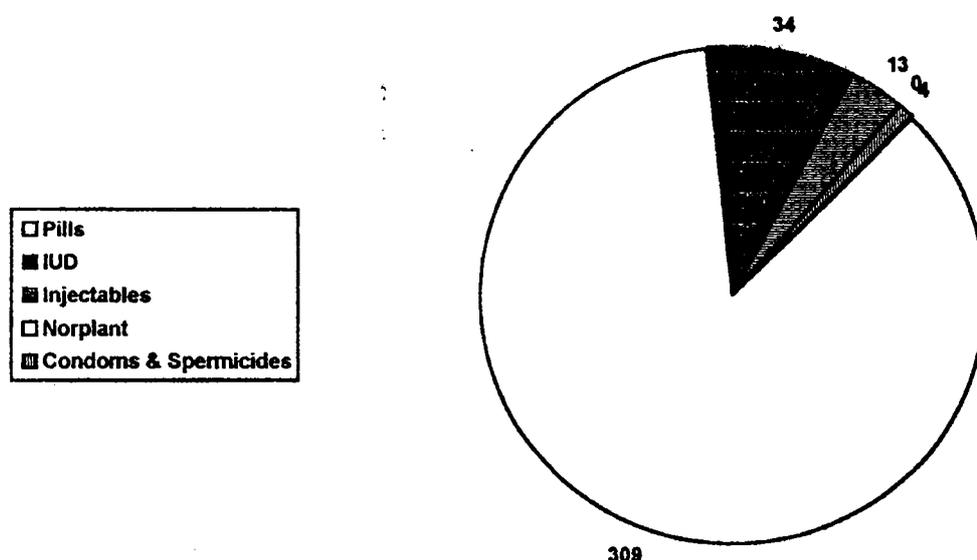
The most vulnerable age group 21-30 years had a mean of 33% positivity prevalence.

< 20 and > 30 and 21-30 (relative prevalence)  
 with positive STD (O.R) = (3 : 1)  
 (association between age and STD)

\* in bracket are percentages

**Table 6.7: Distribution of Contraceptive Methods available in our Family Planning Clinics**

Method	Frequency	Relative frequency (%)
Pills (X1)	673	86.0
IUD (X2)	74	9.5
Injectables (X3)	28	3.6
Norplant	-	-
Condoms & Spermicides (X4)	Occasionally	1.02



**Figure 3: Pie chart representing percentage of contraceptive prevalence among the 783 persons consulted. Pills have the highest prevalence of 86%.**

## CHAPTER SEVEN



# DISCUSSION

## CHAPTER SEVEN

### DISCUSSION

The results obtained at the end of this study will be discussed as follows:

#### Epidemiological Aspect

##### STD and Age

42.7% of our study population were of ages between 21-30 years.

Of the 52.2% of clients, ages between 15-45 years, who responded, 76.3% had atleast one STD as compared to 84.6% in Ethiopia (37).

We obtained a mean age of 27.6 years which is not very different from ages of other African studies - 25 year (20, 37).

The highest representation of STD infections and AIDS was found among the age group of 21-30 years (33%) as compared to 37.8% and 30% in previous Cameroonian studies (34). Comparing the mean age and the highly infected age group, we recognised that they are the range of ages of optimum reproduction in our community (18), hence the tendency for family planning to avoid unwanted pregnancies after unprotected sexual intercourse. This then predisposes them to having STDs and AIDS.

##### STD and Marital Status

Of all the clients seen, 14.4% exhibited STD risk factors of which 54.9% were married (mono/polygamy) and 31.9% were either unmarried or monogamously married. 46.7% of our unmarried clients were tested positive for atleast one STD as compared to 82% in Zimbabwe(20) and 72% in Addis Ababa, Ethiopia(37). This significant difference between Cameroon and the quoted references is probably because very high proportion of their study population were prostitutes and bar girls while, though not clearly brought out in this study, our study population was mainly married women (54.9%) and of the unmarried, mainly students.

Nasah, working on the relationship between gonorrhoea and marital status showed that monogamously married women were mostly infected (43%) followed by the unmarried (26%).

### **Disease Prevalence**

There exist more than twenty STDs in Africa in general and Cameroon in particular but our study was limited to the most current in Cameroon. A 28.9% Chlamydial prevalence confirmed the first position of Chlamydial infection in most studies nowadays (30, 37, 8, 41, 17, 11, 13, 42). Gonorrhoea, which occupied the first position in the early 20th century (18, 35) occupied a less privileged position with a prevalence of 6.7%, hopefully because the clinical signs of gonorrhoea are early with respect to chlamydial infections, though late in majority of women (43, 44) and treated in STD clinics before coming for Family Planning consultation.

HIV, the song of the decade, was also significantly high (8.9%) in our Family Planning Clinics because 99.3% of 89.7% of our total female population know at least something about HIV (45).

With the probable STD protective and moniliase predisposing effect of oral contraception (12, 15), the prevalence of Candida, 24.4%, did not surprise us. These prevalence rates are not very higher than the few published available data from FPC elsewhere in Africa: gonorrhoea 23.66%, (32, 33, 34, 35, 36, 37, 4, 38, 13), genital Chlamydia 16-64% (39, 37, 4) and HIV 2-16% (36, 40). (Table 2)

### **Contraceptive Prevalence**

Oral contraceptives with 86% prevalence and 74.2% in Addis Ababa (37) made us to think and realise that though many clients complained of the exhausting daily tablets, they preferred it because it had "little interference with fertility and menstrual cycle" as compared to other contraceptive methods.

Norplant, one of the most recent contraceptive methods was not used in this study because the FPC staff of the units visited were not trained for norplant contraception.

Spermicides with chemicals against STD (16) and condoms, though some degree of failure (36) prevents a greater part of STDs (16), were almost out of use (1.02%). This, most probably, is due to the fact that they are sold almost everywhere and can be easily got than in the family planning clinics.

### **Control of STDs Using FPC**

The FPCs provide a favourable setting for screening women particularly at risk because of high sero positivity for STDs, who for lack of symptoms and lack of financial resources will attend neither an STD clinic nor a hospital for routine investigation. More-over STDs, especially those causing genital ulceration, facilitate the transmission of HIV.

The potential benefits of FP or family spacing include the spacing of pregnancies, advice regarding infertility, regular health checks for the mother and prompt treatment of asymptomatic STD. Where the preferred method is oral contraception, the most obvious limitation is that for high risk women, there is increased risk of CIN and increased risk of STD (37), engendered by a false sense of security associated with increased sexual activity. The IUDs we found caused acute salpingitis in women who had clinical evidence of past infection (15), or were from high risk behaviour groups.

Condoms, recommended for prevention of HIV transmission especially in high risk groups, also have their limitations, and will have increasing limitations as free supplies to developing countries are cut. Young people must be taught the virtues of abstinence and self-control. Equally important and recent test on condoms which throw doubts on their efficacy:

-firstly, in London in 1987 a survey of condoms (46) showed that 20 out of 25 brands tested failed the then British standard requirements of not more than 3% being faulty in the packet (47);

-secondly, in 1992, of those tested in Southern Europe and some developing countries, only 3% were shown to be "very good" (48);  
-thirdly, stringent laboratory quality checks on 633 batches of condoms from a total of 100 million condom tested by one African country showed 243 (38%) defective.

The highest percentage (78%) of batches found to be defective was in condom donated by an international agency (47-52).

Interestingly, HIV seropositivity in antenatal clinic attenders in Harare is higher among the women who reported using condoms either with their husbands or, moreso, with casual partners (53). It is thus of significance that WHO has stated that "the most effective way to prevent sexual transmissions of HIV is to abstain, or for two uninfected individuals to be faithful to one another (54).

### **Limitations**

Though we did all we could with the resources available to carry out a perfectly scientifically based study, we still had certain shortcomings.

- 1) In principle, all patients with risk factors were to be sent to a standard laboratory ("Centre Pasteur" in this case) and their results analysed but this was almost always impossible because the tests were very expensive and only capable individuals could afford. This obliged us to pay the tests for some of our clients.
- 2) The mission hospitals involved in the study setting wanted all their patients to do the tests in their laboratory hence not making things easy for us. For this reason almost all their patients were excluded from the study.

## Conclusion

We have reviewed the literature relating to contraception and STDs. We reported a high prevalence of STDs as well as its complications in FPC attenders in Yaounde. FPCs, thus, are seen as providing a key facility for the detection and treatment of STDs in sexually active women as well as the tracing, counselling and treatment of their conjoins. Further training of MCHC workers together with additional funding to allow more diagnostic facilities, on-site education of women attending for FP advice regarding the signs, symptoms and consequences of STD.

We found the utilisation rate to be highest in those with less than 3 children, unmarried and those of ages 21-30 years.

Prevention of genital tract infection is high among these women, most infections are asymptomatic, and symptomatic infections are frequently not recognised (20).

However, screening of FPC attenders for STDs/AIDS will help reduce STD complications as well as AIDS in our community.

### **Recommendations**

At the end of this study and its available results we recommend:

- 1) that seroepidemiological surveys of FPC attenders be carried out from time to time to ascertain the prevalence of STD in selected but representative populations and geographical locations;
- 2) screening for STDs be put into practice as it is suppose to be in our family planning clinics;
- 3) that FPCs be furnished with suitable equipment's to carry proper screening of STDs in order to diagnose and treat early hence reducing STD, AIDS and its complications;
- 4) that our FPC staff be trained to be able to carry out all FP procedures like implants, IUDs, etc.;
- 5) education of our reproductive age group about STDs, HIV/AIDS and promote the use of condoms.

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# **ANNEXES**

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## **ETHICAL CONSIDERATION**

- \* Obtain an ethical clearance from the Faculty of Medicine and Biomedical Sciences, Yaounde, issued by the Dean;
- \* Written application for authorisation from the hospital concern in the Study Setting;
- \* After explanation of the study, it will be optional after a free and voluntary informed consent;
- \* Results will be kept anonymous during and after the study.

## CONSENT FORM

Date \_\_\_\_\_

I \_\_\_\_\_  
have understood the objectives and procedures of this clinical evaluation and  
paraclinical investigation and have accepted freely to be included in the study  
without any prejudice.

## QUESTIONNAIRE

### Identification of Patient

Name:

Age:

Parity:

Marital status:    married                       single                       **LMP:**  
                          polygamy                       multiple partners   
                          divorced                       recent change of partner

Profession:

Residence:

Address:

Ethnic group:

### Antecedent History

MEDICAL:	Yes	No
Diabetes	<input type="checkbox"/>	<input type="checkbox"/>
Hypertension	<input type="checkbox"/>	<input type="checkbox"/>
Renal Disease	<input type="checkbox"/>	<input type="checkbox"/>
Previous STD	<input type="checkbox"/>	<input type="checkbox"/>
If yes, treated?	<input type="checkbox"/>	<input type="checkbox"/>
Others	<input type="checkbox"/>	<input type="checkbox"/>
If yes, name them _____		
_____		

### **GYNAECOLOGICAL**

Previous infection                                              
 If yes, precision \_\_\_\_\_  
 \_\_\_\_\_

### **OBSTETRICAL**

Previous contraceptive use?                            
 Type \_\_\_\_\_

Stopped?    
 If yes, date \_\_\_\_\_  
 Reason \_\_\_\_\_

Current contraceptive method? Yes  No   
 If yes, type \_\_\_\_\_  
 Start date \_\_\_\_\_  
 Reason(s) \_\_\_\_\_

**DRUGS**

	Yes	No
Cortico therapy	<input type="checkbox"/>	<input type="checkbox"/>
Immuno-suppressors	<input type="checkbox"/>	<input type="checkbox"/>
Prophylactic antibiotics	<input type="checkbox"/>	<input type="checkbox"/>
Others	<input type="checkbox"/>	<input type="checkbox"/>
If yes, precision	_____	

**CLINICAL EVALUATION**

General state: Good  Moderate  Poor   
 T° \_\_\_\_\_ BP \_\_\_\_\_ PR \_\_\_\_\_ RR \_\_\_\_\_  
 Conjunctiva \_\_\_\_\_  
 Itches \_\_\_\_\_  
 Genital ulceration \_\_\_\_\_  
 Discharges \_\_\_\_\_  
 Lower abdominal pain \_\_\_\_\_

Thorax: Heart \_\_\_\_\_  
 \_\_\_\_\_

Lungs \_\_\_\_\_  
 \_\_\_\_\_

Abdomen: \_\_\_\_\_  
 \_\_\_\_\_

Vaginal Examination:

Vulva \_\_\_\_\_

Vagina

Warm: Yes  No

Cervix Yes No

open

tender

Gloves

discharge?

If yes, offensive?

colour \_\_\_\_\_

chondyloma

**PARACLINICAL INVESTIGATION**

Vaginal swab (smear):

- gonococcus \_\_\_\_\_
- trichomonas vag. \_\_\_\_\_
- garduerella vag. \_\_\_\_\_
- candida alb. \_\_\_\_\_
- others \_\_\_\_\_

Serologic tests

- VDRL/TPHA \_\_\_\_\_
- Chlamydia \_\_\_\_\_
- HIV1, 2 \_\_\_\_\_
- Herpes II \_\_\_\_\_

## TIME TABLE (GANT-FLOW CHART)

Year													
	1997	1998											
Months of Activity	D	J	F	M	A	M	J	J	A	S	O	N	D
Writing of Protocol	→												
Computerising Protocol		→											
Recruiting of Subjects			→										
Data Analysis										→			
Correction and Printing											→		
Presentation and Defense													→