

Reproductive Health at the Turn of the Millennium: A Glance Back

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Abstract

At the beginning of another millennium, it seems appropriate to take stock of the major developments that have taken place in reproductive health care, particularly in the last century. Although reproductive health has become a truly multidisciplinary enterprise, the co-ordination of reproductive health care services will continue to rest on the Obstetrician/Gynaecologist because pregnancy and childbirth are at the very core of the reproductive process. Specialists in the discipline therefore have a crucial role to play in training, advocacy, community education and mobilisation of resources to improve the standard of reproductive health in the society and provide wholesome reproductive health care services to their communities.

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As we stand at the threshold of the third millennium of *Anno Domini* or the Common Era (based on the Gregorian Calendar), it seems appropriate to assess what progress has been made in human reproductive health in times past and try to steal a glance into the future of the discipline. In looking back over the approximately nine millennia of recorded human history, it becomes obvious that the degree of progress made in reproductive health care in the first eight thousand, nine hundred years pales into insignificance when compared with the epoch-making changes that have occurred over the last one hundred years. The major focus of this communication will therefore be innovations in reproductive health in the last century of the second millennium.

Overview of Reproductive Health

Although reproduction is a major prerequisite for the perpetuation of any specie and the human specie has been very adept at reproducing and dominating its environment, it was not until a few years ago that a clear description was given of the concept of human reproductive health. At the International Conference on Population and Development in Cairo, Egypt in 1994, reproductive health got a consensus definition part of which is reproduced here: "Reproductive health is a state of complete physical, mental and social well-being in all matters pertaining to the reproductive system and its functions"¹ The remainder of the definition is a long windy statement, the product of intense bargaining between the various interest groups that were represented at the conference and will not be repeated here. Suffice it to say that a person cannot be said to be in a state of reproductive health until his/her offspring have been able to repeat the process of reproducing the specie by giving birth to the next generation.

The aim of reproductive health care is to bring every member of the community into a state of reproductive health through the provision of "a constellation of methods, techniques and services"¹ that will enable the attainment of

this objective. The services that ought to be covered in a standard reproductive health care service are outlined in Text Box 1.

Text Box 1

The Scope of Reproductive Health

1. **Maternity Care**
2. **Infant and Child Health**
3. **Adolescent Health**
4. **Sexual Health**
5. **Congenital Anomalies of the Reproductive Organs**
6. **Acquired Abnormalities of the Reproductive Organs**
7. **Infertility and Assisted Conception**
8. **Fertility Regulation**
9. **Abortion Care**
10. **Reproductive Tract Infections**
11. **Reproductive Tract Tumours**
12. **Reproductive Health in the Elderly**

As seen in the outline, reproductive health is not gender specific and it cuts across the traditional medical specialities of Obstetrics, Gynaecology, Andrology, Urology, Paediatrics and Child Health. It also requires the input of nurses and midwives, community health workers, social workers, sociologists and mental health personnel. However, the co-ordination of reproductive health care services will continue to rest on the Obstetrician & Gynaecologist because pregnancy and childbirth are at the

very core of the reproductive process. In tropical countries where many of the other disciplines mentioned are either non-existent or offer only rudimentary services, the role of the Obstetrician looms even larger. Hence the need for this reminder to our readers of what a long way we have come and how some of the developments of the past are impacting the present and point out the way to the future.

Maternity Care

Maternity care has existed in some form for several thousand years. A clear reference is made to the activities of midwives in the book of Exodus². Presumably, such activities were restricted to the period of parturition being the period when the most dramatic events of reproduction occurred and the time when the woman was at greatest risk of losing life or limb! In the past century, maternity care moved from being a totally intrapartum affair into the realms of antenatal supervision and care, first in major metropolitan centres like Paris, New York, Edinburgh and Adelaide, and later in other parts of the world. Eventually, the interest of reproductive health care providers extended to the period immediately after childbirth and formal postnatal care evolved. Most recently, preconception care arrived on the scene. (Text Box 2).

The management of pregnancy and its complications has undergone a tremendous change in the last century. In my opinion, the four most important innovations of the past century are the introduction of structured antenatal care, the arrival of antibiotics, the invention of ultrasonography and its applications in managing pregnancy-related complications and, finally, the development of the partograph.

Arguably the single most important factor driving the changes in practice, particularly in the last quarter of the past century, is the development of high resolution real-time ultrasonographic scanning (RT-USS). This technology owes its origins to the sonar devices used to locate submarines during the Second World War. It has had a particularly huge impact on the diagnosis and management of abortions (especially threatened abortion), hydatidiform moles, ectopic gestations, multiple pregnancy and antepartum haemorrhage. It is invaluable in the estimation of gestational age and the detection of fetal anomalies. The impact of these and other developments on current practice are elaborated upon below.

Diagnosis and Management of Abortion: Prior to the advent of RT-USS, a large number of patients who had vaginal bleeding in the early part of pregnancy were assumed to have 'threatened abortion' and were consigned to prolonged periods of bed rest in hospital. We now know (thanks to this technology which became firmly established in the last thirty years) that a significant proportion of these women have blighted ova and missed abortions and need not be victimized further by a prolonged period of confinement to a hospital bed.

Text Box 2

Comprehensive Maternity Care

Pre-Conception Care

Antenatal Care

Intrapartum Care

Postnatal Care

Diagnosis and Management of Ectopic Pregnancy: Although laparoscopy had become widely available by the 1970s and a few cases of ectopic gestations were being detected by that route, the overwhelming majority of these patients did not come to the notice of reproductive health care providers until the gestational sac (and the oviduct in which it is ensconced) had ruptured and placed the woman at considerable risk of losing her life. Later on, as indications for the use of laparoscopy in patients with pelvic pain became liberalized, more patients had the gestational sac excised before it could rupture. In contemporary times, high resolution RT-USS using vaginal probes in conjunction with sensitive assays for the beta-subunit of human chorionic gonadotropin (hCG) have provided a less invasive means of making the diagnosis. Treatment modalities have also expanded in scope and it is now possible for the patient to avoid surgery altogether through the use of systemic or local administration of methotrexate.

Diagnosis and Management of Antepartum Haemorrhage: Bleeding in the final three months of pregnancy is another condition that hitherto had necessitated prolonged periods of hospital confinement for such patients. The reason for this was the likelihood that the bleeding was due to an abnormally low-lying placenta, which could cause catastrophic bleeding unexpectedly. Different methods, often very hazardous to mother and fetus, such as X-rays and radioisotope scanning were tried in a vain effort to ascertain whether or not placenta praevia indeed existed in such patients. With RT-USS, it is usually possible to locate the placenta in the gravid uterus with a reasonable measure of precision.

Prenatal Diagnosis: This is an area where RT-USS and some other new techniques of diagnosis have literally 'opened our eyes'. To illustrate the level of frustration among obstetricians on the subject of prenatal diagnosis in the 1970s, I will like to paraphrase the legendary Ian Donald of Glasgow on the subject as published in 1979. "*Clinical examination of the mother [for prenatal diagnosis of fetal anomaly] is so imprecise as to be little better than soothsaying. Radiology is [often] impracticable..... and may be misleading. Biochemical analysis only provides help after the halfway point of pregnancy. Fetoscopy can only be regarded as a research tool with hazards which are prohibitively high.*"³. He did hold out some hope for RT-USS in this regard, a hope that has been more than fulfilled.

He however did not foresee the explosion in knowledge that has occurred in molecular biology in the last twenty years; with such techniques as the polymerase chain reaction (PCR) and genetic mapping that have made the prenatal diagnosis of many genetically transmitted conditions possible. The concomitant development of the technique of chorionic villus biopsy has made it possible to make such a diagnosis in the first trimester of pregnancy.

Fetal Therapy: In addition to these advances in diagnosis, fetoscopy has made intrauterine transfusion and surgical correction of some congenital anomalies in the fetus possible, thereby enhancing the scope of fetal therapy. Fetal therapy had hitherto been limited only to administering drugs to the mother in the expectation of transplacental transfer to the fetus for the desired effect.

Management of Labour/Use of the Partograph: The other major development in maternity care that I believe merits mention is the use of simple technology in improving the chances of a woman passing safely through labour. I am referring to the partograph, which came into its own in the last twenty years following the pioneering work in the study of the dynamics of labour in Zimbabwe by Philpott⁴ and its eventual adoption by the World Health Organization (WHO) more than a decade later. Antibiotics have brought about a drastic reduction in case fatalities associated with abortion-related and puerperal sepsis.

Infant and Child Health

This continues to be the preserve of paediatricians and community health physicians. However, it is pertinent to highlight some of the major advances that have produced the marked improvement in childhood survival and life expectancy that we have become accustomed to. From my perspective, the three most important advances of the past century are the arrival of antibiotics, the development of effective vaccines against common childhood communicable diseases and the serendipitous discovery of oral rehydration therapy. One may also want to consider the rediscovery of the advantages of exclusive breastfeeding of infants. There have also been notable advances in the care of the newborn, particularly those with very low birth weights either because of being born before pregnancy has reached term or because of growth restriction *in-utero*, but we will not dwell further on these.

Adolescent Health

The specific health needs of adolescents have been coming into special focus in recent times. This has led to the evolution of special programmes designed to address those needs. Such programmes are, by necessity, multidisciplinary in nature. What is, however, of utmost concern to reproductive health care providers is to ensure that none of the risk-taking escapades normally associated with adolescence impairs their reproductive fitness in adulthood.

Sexual Health

This was one of the more contentious issues at the ICPD meeting in Cairo. Many of the women's health advocacy groups were unrelenting in their efforts to ensure the inclusion of sexual health and rights as well as reproductive choice in the definition of reproductive health and in the final conference declaration. They were largely successful in doing this, but it is yet to translate into major programmes of action to improve the sexual health of both women and men.

Congenital Anomalies of the Reproductive Organs

There has been a tremendous improvement in our understanding of the causation of many of these congenital abnormalities that impair the ability of affected individuals to enjoy sound reproductive health. While some of these disorders have been recognised for hundreds of years, the differences between those that were formerly lumped together as syndromes are only being elucidated. This improvement in understanding has come about as a result of expanding knowledge in genetics and in human reproductive endocrinology. Improvements in surgical skills and materials have also expanded the range of management options available to gynaecologists and urologists managing these problems.

Acquired Anomalies of the Reproductive Organs

Many of the disorders in this category have been known for aeons. They include problems like uterovaginal prolapse, disorders of the normal control of micturition, acquired gynaetresia, urethral strictures and a host of other diseases that arise because of genetic predisposition or environmental factors, including lifestyle choices. Again, advances in surgical techniques have improved the ability of health care providers to provide succour for affected individuals.

Infertility and Assisted Conception

The management of infertility has undergone a revolution in the last quarter of a century. Male infertility used to be a condition with no reliable remedy. Now it is the rare case of male infertility that cannot be treated with the vast array of assisted reproduction options that are available. Unfortunately, most of these techniques are prohibitively expensive and remain largely unavailable to the vast majority of people residing in the tropics.

Assisted Reproductive Technology: Louise Browne, the first 'test-tube' baby was born in 1978. Since then, there have been numerous advances in the area of assisted reproductive technology including the transfer of gametes or zygotes into the oviducts as opposed to the traditional embryo transfer into the uterus.

Later on came intracytoplasmic sperm injection (ICSI), ovum donation and surrogacy. Each new development has created new ethical controversies, the resolution of which may take several decades. Whatever their downside, these new techniques have brought smiles to the faces of many women who twenty-five years ago would have had to resign themselves to a life of childlessness.

Preimplantation Diagnosis: Somewhere in-between assisted conception and prenatal diagnosis, has emerged the new technique of pre-implantation diagnosis. Individual cells are spliced out of the developing embryo to screen them for abnormal karyotypes or the synthesis of abnormal gene products and if no abnormalities are found the embryo is then implanted in the uterus. This technique, which was virtually unknown ten years ago, has become routine practice in some of the top-flight assisted conception units.

Polycystic Ovary Disease: This is an example of a reproductive endocrinological abnormality that is commonly associated with infertility. Two decades ago, it was a poorly understood entity, appropriately called a 'syndrome'. Empirical trials had shown that slicing off a piece of each ovary sometimes produced salutary results in some affected individuals and up until about two decades ago, 'wedge resection' of the ovaries was the treatment of choice for the syndrome. Anyone following that approach today will be assumed to be guilty of malpractice until it can be proved otherwise. The pathogenesis of the disease is now better understood and effective pharmacological methods of treatment, aimed primarily at ovulation induction, are available.

Management of Endometriosis: Endometriosis is a major cause of infertility, particularly in the Western World. The conventional wisdom up till a few years ago was that it was uncommon in this environment. The widespread use of laparoscopy in this environment has compelled a revision of that view. The treatment of endometriosis as recently as twenty-five years ago could be summarized in two phrases: 'watchful expectancy in mild cases' and 'pelvic clearance in severe cases'. Since then, vast arrays of hormones and hormone-modulators have been tried with varying degrees of success. Certainly weak androgens like danazol and gonadotropin-releasing hormone analogues like goserelin have revolutionized the management of endometriosis in the last decade or so.

Fertility Regulation

From several centuries, men and women had yearned for reliable means of uncoupling copulation and conception. Various methods were tried with varying degrees of success. These include the use of various plant extracts either to modulate uterine receptivity, as spermicides, or as abortifacients⁵. It was not until the early 1960s that highly effective and reliable methods of contraception in the form of the oral contraceptive pill and the intrauterine contraceptive devices became widely available. Following these spectacular achievements in contraceptive technology,

there was a relative lull in the decade that followed. The oral contraceptive pill and the plastic intrauterine contraceptive device (IUCD) were so effective and enjoyed such wide acclaim that there seemed to be no incentive to seek newer methods.

With prolonged use however, the shortcomings of these methods became apparent and the need to develop longer-acting hormonal methods that also avoided the first liver passage became inevitable. The result of these efforts manifested in three main areas: hormonal implants, vaginal rings and hormone-releasing IUCDs. All of these are now available, significantly increasing the number of options available and increasing the ability of the care provider to meet the specific needs of a larger number of contraceptors at less risk of harmful side effects.

Abortion Care

Efforts to improve the quality of abortion care services available to women have always been clouded by the emotive debate about the morality and/or legality of inducing abortions. This is very unfortunate because it tends to draw support away from the need to provide services for the large number of women having spontaneous abortions every year. Many women, deprived of this needed care, suffer avoidably from the many sequelae of abortion, including the loss of their lives. Women's health advocates have been directing efforts at correcting the situation, but abortion care services in many parts of the world remain sub-optimal.

Reproductive Tract Infections

Clear references are made to purulent urethral discharge in the Holy Bible and reproductive tract infections, a group of diseases characterised by the presence of micro-organisms in the genital tract which damage the structure or functional ability of the reproductive organs, have always attracted a lot of attention because a large proportion of them are sexually transmitted. The term gonorrhoea was first used by Galen in 130 AD⁶ and syphilis has been recognised in Europe since Columbus returned from his first trip to the Americas in 1493. It was not until the 19th century, however, that the organisms causing many of these infections were first recognised and new ones are being identified all the time.

Several new developments have occurred in the area of detecting and treating sexually transmitted infections (STIs) in the last century. Since Alexander Fleming discovered penicillin during the Second World War, gonorrhoea and syphilis have ceased to be the terrors they once were, but they have now been replaced by the human immunodeficiency virus and the acquired immune deficiency syndrome it induces (HIV/AIDS). Some of the areas of progress in the recent past include the laparoscopic diagnosis of acute pelvic inflammatory disease in women and the fine-tuning of the syndromic approach to the treatment of STIs. They have all, however, been

overshadowed by 'the disease' of our age, HIV/AIDS. Twenty-five years ago, the disease was unknown. Today, it is the leading cause of death among people of reproductive age in many sub-Saharan African countries. It is altering the demographic structure of many communities and leaving despair and a sense of helplessness in its wake. Once upon a time, medical students had to devote a significant proportion of their period of training towards learning about syphilis and its long natural history. The students of this generation may find that they have to devote a large chunk of their time to learning what HIV/AIDS is all about.

Reproductive Tract Tumours

The commonest tumour of the female genital tract is the uterine leiomyoma. Fortunately, it is almost always a benign tumour although it may sometime lead to life-threatening haemorrhage. The commonest malignant tumour of the female genitalia in most tropical countries, Nigeria inclusive, is cervical cancer. This is unfortunate because this is a largely preventable disease. It became preventable largely through the efforts of one man, George Papanicolaou who devised a method of screening for the disease before it became invasive. Although he discovered the technique of doing this in the 1920s, it took another thirty years for it to be adopted for clinical use.

HPV and Cervical Cancer: It has long been known that cervical cancer has many of the attributes of a sexually transmitted disease (STD). Relative risk of developing cervical cancer is increased 2- to 10-fold with early age of first intercourse, multiple sexual partners, as well as previous STDs. In the 1970s, researchers made strenuous efforts to establish a causative link between the Herpes Simplex (Type II) virus and cervical cancer. Such a link could not be proven. However, the human papilloma virus (HPV), which attracted attention about a decade later, has been shown to have such a link. Patients infected with some types of HPV have been shown to have an increase in relative risk of greater than 20-175 of developing cervical cancer. While other STDs may play a role as cofactors, HPV is causal⁷. It seems that infection occurs when the cervix is exposed to the sexually transmitted agent at a time when it is susceptible. The sexually transmitted agent seems to interact with the immature metaplastic area of the transformation zone, present in young patients, while infection is less likely in the presence of stratified squamous epithelium. With such an insight, new strategies could now be deployed both for screening and for preventing cervical cancer.

Screening for Cervical Intraepithelial Neoplasia (CIN): The standard technique of screening for pre-invasive lesions of the cervix over the last fifty years has been the Pap smear. Unfortunately, if it is to be extended to cover a meaningful proportion of the population at risk, large numbers of skilled cytotechnicians and pathologists are required. These are often beyond the reach of poor countries like those of sub-Saharan Africa. Alternative approaches have been developed in the last few years that

depend more on direct visual inspection. These methods are cheaper and will hopefully lead to wider coverage of the women at risk.

Intraepithelial Stages of Endometrial Carcinoma: In the 1970s, it was recognized that endometrial carcinoma was commoner in women of low parity and those with anovulatory disorders. It was not until the following decade, however, that the link between unopposed oestrogenic action on the endometrium and the subsequent development of cancer was recognized. Definite pre-invasive stages of the disease also became clearly defined. Significant advances have also been made in the management of the disease including agreement on a new approach to the clinical staging of the disease.

Screening for Ovarian Cancer: Screening for ovarian cancer was virtually an unviable exercise twenty-five years ago because no reliable tools were available for the task. The advent of RT-USS and the identification of some biochemical products (tumour markers) from such lesions are gradually altering the picture. The results have not been encouraging in terms of reduction in mortality from the disease, but this situation is likely to change, as the screening methods are refined further.

Reproductive Health in the Elderly

It is only in the past century that life expectancy has improved to the extent that there are now large numbers of senior citizens in the more affluent societies in the world. This has made the reproductive health problems of the elderly a major public health concern. In men, prostatic disease remains the most worrisome problem, although erectile and ejaculatory dysfunction also feature prominently. For women, the loss of ovarian steroid hormones brings about many unwanted changes particularly in the suppleness of the external genitalia and the bone loss that leads to pathological fractures. These problems are the subject of intense on-going research.

Conclusion

The provision of reproductive health care services has undergone a lot of change over the ages, particularly in the final half-century of the past millennium. Indications from contemporary research findings are that we are on the threshold of even more momentous changes. Unfortunately, men and women in Nigeria and other tropical countries are yet to derive full benefits from the improvements that have been made in reproductive health care. Maternal mortality and morbidity continues to wreak havoc on our womenfolk in spite of proven strategies for their control⁸. Many women in our society still expose themselves to the numerous hazards of grandmultiparity out of a misplaced desire for large families or because they have lost children to one of the countless communicable diseases that continue to decimate the ranks of our infants and young children⁹. Seemingly oblivious to these risks, these grandmultipara compound the situation by failing to utilise the standard health facilities available in their communities¹⁰.

Obstetricians and Gynaecologists in the society need to take a more activist stance in ensuring that a full range of reproductive care services is delivered to our women and their offspring.

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