

Recent Advances and Future Trends in Obstetrics and Gynaecology

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Abstract: Medical science is ever evolving and Women's health issues have come a long way from when the patient was treated for only dire emergencies or end-stage disease to comprehensive counselling and treatment options for the whole range of related and definitive illnesses suffered spanning the prepubertal to the post menopausal age. Herein is an insight into emerging trends and advances in Obstetrics and Gynecology and their impact on improving healthcare.

Healthcare as we know it is becoming increasingly centralized and rural areas are being managed by trained midwives at various levels. Internationally a lot of focus and encouragement is being given in this view. In 2004 the SOGC Council put forward motions to encourage support for regulated Canadian midwifery programs, integration of midwifery practices into collaborative programs, optimal funding and appropriate privileges for registered midwives, and midwifery programs for Aboriginal midwives.¹

The concept of job-sharing has come to the fore where it has been considered that a physician with fewer working hours and less heavier clinical load can deliver better patient care. That is why we need to create and fill residency positions in the rural areas whilst equipping them along with adequately trained midwife staff, thus allowing a proper tier referral system and a systematic decongestion of tertiary healthcare centres. Newer horizons are unfurling and with time,

Obstetrics & Gynecology can "choose a...practice ranging from primary ambulatory health care to...a focused area of specialization."²

Current clinical trends in obstetrics include:

- Increased genetic testing,
- The prevalence of obesity in teenage and adult women
- The steep rise in the number of caesarean deliveries,
- The ongoing debate of vaginal birth after caesarean (VBAC) delivery, and
- New light on causes of neonatal encephalopathy and cerebral palsy.

Recent research on the causes of neonatal encephalopathy and cerebral palsy has found that "intrapartum hypoxia is uncommonly the sole cause of neonatal encephalopathy or cerebral palsy," according to an ACOG Task Force on Neonatal Encephalopathy and Cerebral Palsy, which published its findings in 2003. "Less than a quarter of infants with neonatal encephalopathy have evidence of hypoxia or ischemia at birth..." it stated. The Task Force set certain criteria, especially blood gas analysis, to accurately determine the timing hypoxia presented, like, close to the time of birth, during labor and delivery. Earlier, it was thought that such meconium stained liquor, non-reassuring fetal heart rate patterns, low Apgar scores, and neonatal encephalopathy were enough proof of birth asphyxia. But new evidence and more studies indicate that they are in fact "the sequelae of pathological processes established before labor." The Task Force's report says, "Criticism of the management of labor should not be confused with cerebral palsy causation because the two often may not be linked."³ This ACOG Task Force's findings have had a major impact on obstetrics litigation. These cases can now often be defended on the issue of causation.

INAPPROPRIATE TERMINOLOGY

An ACOG Committee Opinion issued in December 2005 expressed concern about ongoing use of the terms "fetal distress" and "birth

asphyxia," recommending abolition of the term "birth asphyxia" as a nonspecific diagnosis and replacing "fetal distress" with the term "non-reassuring fetal status."⁴

APGAR SCORES: NOT PREDICTIVE

Apgar scores have been used since the 1950s to describe the condition of neonates. ACOG advocates that its use be restricted to the labour & delivery room and not beyond as an indication or report of an acute intrapartum hypoxic event. Low Apgar scores at one and five minutes neither indicate hypoxia nor predict long-term neurologic outcomes.⁵

LIMITATIONS OF ELECTRONIC FETAL MONITORING

EFM has its limitations. An ACOG Practice Bulletin issued in December 2005 reviewed some of these limitations:

- The false positive rate of EFM for predicting adverse outcomes is high.
- The use of EFM is associated with an increase in the rate of operative deliveries (vacuum, forceps, and caesarean section)
- The use of EFM does not result in a reduction of cerebral palsy case rates This same bulletin sets forth the guidelines for the frequency of reviewing EFM tracings and their retention as part of the medical record.⁶

THE 30-MINUTE INTERVAL GUIDELINE

In 1989, ACOG's Committee on Professional Standards first established "that hospitals with obstetric services should have the capability to begin a cesarean delivery within 30 minutes of the time that the decision is made to perform the procedure."

The Guidelines for Perinatal Care, published jointly by the American Academy of Pediatrics and ACOG, follows that same guideline. Research indicates a lack of evidence for improved maternal and infant outcomes even when this guideline is followed. Nevertheless, this 30-minute interval has become a medico-legal point when cesarean section is required. Bloom *et al* studied maternal and infant outcomes and found that a cesarean delivery with this 30 minutes interval guideline does not prevent all poor infant outcomes and "by no means guarantees infant safety."⁷ This is consistent with the findings of previous studies that a delay in cesarean delivery exceeding 30 minutes did not necessarily compromise infant outcomes.

HIGH RISK OBSTETRICS: THE FUTURE

There is no other physician practice area that can speak of a more volatile and unpredictable high risk environment like obstetrics. Fortunately nowadays the concept and implementation of simulation training has come to the fore to help us manage difficult and

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emergency situations- “hope for the best but be prepared for the worst”. Patient safety now has a higher profile in obstetrics as reflected in journal articles of recent years. However a need for more research is felt to promote better management to optimize more favourable patient outcomes.

Investments in obstetric patient safety maximize their return by preventing high-severity claims. Some patient safety approaches that hold promise include:

- 1.) Obstetrics Rapid Response Teams⁸
- 2.) Medical emergency preparedness strategies, such as training, stocking appropriate supplies, early warning systems, and specialized first responders⁹
- 3.) Team training using crew resource management techniques borrowed from the military and the airline industry¹⁰
- 4.) Commercially available clinical informatics systems that promote patient safety at the patient’s bedside and in real time
- 5.) Health care professionals to determine which format (send staff to a simulation center, develop in-house simulation program, develop a consortium of hospitals that run a simulation program, or use a mobile simulation program) is best for them.

In situ simulation is an effective way to develop new skills, to maintain infrequently used clinical skills even among experienced clinical teams, and to uncover and address latent safety threats in the clinical setting.¹¹ High-fidelity simulators have been developed to educate residents in anaesthesiology. Simulation settings that mimic real life crisis situations in obstetric anaesthesia have been created by coupling mannequin with computer. These modalities of training and teaching are highly effective because the risk is zero and any mistakes made are on a mannequin.¹²

EFFECTIVE ANAESTHESIA FOR OBSTETRIC PATIENTS

In various centres all throughout the world, spinal and epidural are now being favoured as the better mode of anaesthesia for delivery by caesarean section. But both are not without their negative aspects- spinal can cause profound hypotension and epidural needs careful monitoring of the patient with frequent top ups. The introduction of combined spinal-epidural anaesthesia (CSEA) offers benefits of both techniques. CSEA also offers the prospect of reducing the anaesthetic failure rate of either technique used alone.¹³

STEM CELL THERAPY AND CORD BLOOD BANKING

Stem Cell technology has taken the world by storm. The potential benefits are innumerable and newer uses are coming on over the horizon. It has already shown promise in treating over 75 diseases like the following:

- Cardiac repair
- Treatment of type II Diabetes Mellitus
- Treatment of neurological injury like- brain injury, Alzheimer’s Disease, Huntington’s Disease, Amyotrophic Lateral Sclerosis, to name a few.
- Malignancies
- Regenerative medicine- of the joint, tissue or organ
- Gene Therapy.
- Patient awareness campaigns are underway and baby’s cord blood is need to harvest these stem cells a relatively easy means of cell procurement.

Stem cell therapy will be a cornucopia of benefits to humanity, virtually unlimited in its future potential. That future begins now.¹⁴

GYNAECOLOGY

Today, gynaecological disease directly affects the quality of life of women in different ways and in varying degrees, highlighting the value and importance of patient assessed health status measures to evaluate the subjective severity and treatment efficacy of common gynaecological conditions.^{15,16} Minimally invasive surgery like laparoscopy and hysteroscopy, interventional radiographic therapy like embolization therapy, medical treatment and expectant management are replacing major gynaecological surgery for many common gynaecological complaints. For example, ectopic pregnancy is being diagnosed earlier by the use of transvaginal ultrasonography and serial quantitative measurements of human chorionic gonadotrophin concentrations. Thus women can be treated either medically as outpatients with methotrexate injections^{17,18} or by laparoscopic surgery, reducing stay in hospital and preserving tubal function in many cases^{18,19,20}.

TREATMENT OF MENORRHAGIA

A women’s lifetime risk of hysterectomy is around 20%. These days, antifibrinolytics and cyclical progestins have played a significant role in reducing the number of hysterectomies done and improving quality of life. Newer trends point to ablative therapies coming to the fore as a better treatment option.^{21,22,23,24} Several techniques are available, and despite initial concerns about safety a recent survey of more than 10 000 operations (MISTLETOE; minimally invasive surgical techniques, laser, endothermal or endoresection) showed that the techniques are safe even in inexperienced hands.²⁵ Although randomised trials have shown ablative surgery to be more effective than medical management,²⁴ the technique is invasive, requires general anaesthesia, is not without complications, and has reduced long term efficacy in women under 45 years of age.^{26,27} Recently introduced balloon devices for ablative treatment may prove to be equally efficacious, simpler, and even safer to use than ablative surgery, although further evaluation is awaited.²⁸

The **Novasure System** is the latest generation of devices that treat the entire inside of the uterus (*endometrial cavity*) at once. The procedure does not require any incisions, and does not require hospitalization. A slender device is inserted through the cervix under local anaesthesia with sedation, or general anaesthesia. Once it is in place, treatment time averages 90 seconds. Most women can resume most of their normal activities in a day or two. A major advantage of Novasure is that hormonal pre-treatment is not needed, and it can be done at any time of the cycle.

Recent randomised controlled studies showed that the efficacy of the levonorgestrel intrauterine system is comparable to that of invasive endometrial ablation²⁸ and that reduction of menstrual loss is significant in most cases.^{29,32} Studies have also shown that between 64% and 80% of women awaiting hysterectomy cancel their surgery after a 6 month trial of the device.^{29,30} The many other potential uses for the device include endometrial protection in hormone replacement therapy, the reduction of climacteric symptoms, and possibly an alternative to sterilisation in women with menorrhagia, although these uses are incompletely evaluated at present. Recent evidence has shown that the levonorgestrel intrauterine system may also reduce the risks of pelvic infection.^{29,30}

TREATMENT OF FIBROIDS

Bilateral embolisation of uterine arteries

The latest in the treatment of large symptomatic fibroids is embolisation of the uterine arteries, but it is being done in only some centres as it is still in the

evaluation phase. results have so far been promising It has been shown that embolisation of the uterine arteries with polyvinyl alcohol particles introduced transfemorally by catheter can significantly reduce the size of large fibroids (60%-65%) and produce significant symptomatic improvement or complete resolution of symptoms³³ The technique is generally well tolerated and requires only a brief admission to hospital for analgesia, although short term side effects such as pyrexia, profuse discharge, and the passage of small or large fibroids through the vagina are common. The treatment is new, and the long term safety and efficacy of fibroid shrinkage are still unknown. Significant morbidity and even mortality as a consequence of infection have resulted from embolisation of the uterine arteries, and it must therefore be considered a new treatment under evaluation until further results are available from large randomised studies. Although pregnancy has been recorded after treatment,^{34,35} embolisation of the uterine arteries is not recommended for nulliparous women until more data on fertility are available However, it may be a useful alternative for difficult or dangerous surgery, for those who decline blood transfusion, or for those who refuse surgery.

ROBOTIC MYOMECTOMY

This is an upcoming trend in the surgical management of fibroids of the uterus. An example of one such is the one done with the Da Vinci Surgical Robot. The surgeon sits at a console and looks through a 3-dimensional video camera. The hand movements in the surgeon are duplicated in the patient by the robot. Most importantly, the instruments duplicate the wrist movements of the surgeon, allowing the instruments to change angles to allow precise suturing.

HORMONE REPLACEMENT THERAPY (HRT)

HRT that can be sprayed into the nose could be the answer for women who have trouble with traditional forms of treatment. The estrogen nasal spray has been hailed the biggest breakthrough since hormone replacement therapy patches were invented 20 years ago. Research shows it is just as effective as other types of HRT but has fewer side effects. A single squirt into each nostril maintains a constant level of oestrogen in the bloodstream, which is effective for 24 hours.³⁶

IN CONTRACEPTION

ESSURE has been proven to be the most effective sterilization procedure commercially available to date.³⁷ Its motivating point is that no incision is needed and it is a relatively comfortable procedure with good results, compared to the other implants used earlier (ADIANA) which had a higher failure rate

Minor procedure units for gynaecology, with one stop investigation and treatment (including ultrasonography and hysteroscopy), and early pregnancy assessment units, where bleeding in early pregnancy can be dealt with rapidly and sympathetically, are becoming more commonplace. The prolonged life expectancy of menopausal women and their higher expectations for health have encouraged new developments in hormone replacement therapy. The increased use of such therapy has also increased surveillance and thus recognition of other common problems affecting older women. Delaying childbearing has resulted in a greater demand for effective fertility treatments and for surgical procedures that preserve fertility.

CONCLUSION

Medical Science is a dynamic cornucopia of latest and more innovative developments and improvements of current techniques and therapies. With better patient awareness and an environment of unrelenting litigation we have found ourselves strenuously trying to balance sound judgement on the part of the physician and well informed consent for

related treatment plans for the patient. So, the final word lies in the fact that ultimately the most effective way to improve healthcare is to make it more collaborative.

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