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Cancer In Pregnancy

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Abstract

Since cancer rarely occurs in pregnancy, the suspicion of cancer is even smaller. However, typical pregnancy symptoms and physiological changes associated with pregnancy make it even more difficult to diagnose cancer in pregnant women. When doubt is justified and supported by physical findings, there is still doubt about the proper use of diagnostic tests. It is devastating for everyone to be diagnosed with cancer, but it is especially devastating for a pregnant woman to have to worry not only about herself but also about the safety of her baby. The most common cancers in women are breast cancer, lung cancer, colon cancer, uterine cancer, thyroid cancer, and lymphoma. When cancer is detected in pregnancy, maternal health must be considered, and fetal prognosis becomes increasingly important.

Keywords: *Cancer, Pregnancy, Childbirth, Care*

Introduction

Critical care unit organization has evolved from the times of Florence Nightingale, who wrote about postoperative recovery areas near the operating suites with attendants at the bedside, to the technologically and medically advanced intensive care units we utilize today [1]. The medical needs of these critically ill patients are quite complex with not only medical or surgical issues that need to be addressed but also the psychosocial parameters of illness that affect the patient. As a result of these complexities, the critical care team has expanded to include many disciplines with varying levels of organizational management.

The average duration of gestation is 40 weeks from the first day of the last menses, with term defined as being between 37 and 42 weeks [2]. The mother's basic physiology is altered in a number of ways during normal pregnancy. Some of these may alter her baseline state and response to critical illness, but others may predispose to injuries and conditions that require critical care.

Hemorrhage and hypertension are the most common causes of intensive care unit (ICU) admission in obstetric patients [3]. The care of any pregnant woman requiring ICU services should be managed in a facility with obstetric adult ICU and neonatal ICU capability. Decisions about care for a pregnant patient in the ICU should be made collaboratively with the intensivist, obstetrician, specialty nurses, and neonatologist. When a pregnant patient is transferred to the ICU, members of the care team should assess the anticipated course of her condition or disease, including possible complications, and set parameters for delivery, if appropriate. The plan should be clear to the medical team and to the patient's family, and to the patient herself if she is able to understand. Because the risk–benefit calculation for a given intervention may change as the pregnancy progresses, it is important to reevaluate the care plan on a regular basis. The plan for delivery should be made long before delivery is imminent.

Pregnancy in the human female is a unique state in which virtually all maternal systems are dramatically altered to permit the sustenance and growth of the intrauterine conceptus [4]. Major physiological changes include cardiovascular, hematologic, metabolic, renal, and respiratory changes, most of which begin soon after conception and continue throughout pregnancy till until late gestation. These changes affect various patient laboratory test results. The body can generally compensate for these changes. However, in the presence of conditions such as anemia, clotting disorders, bleeding during pregnancy, preeclampsia, and trauma caused by motor vehicle accident, the body may not be able to compensate for the

changes. At this point, laboratory values can become significantly skewed from the values normally noted during pregnancy. In caring for pregnant women and their unborn infants, it is important for the healthcare provider to understand the normal physiologic changes that occur during pregnancy. The provider can utilize various laboratory tests and diagnostic tools to assess the magnitude of these changes and to identify abnormal changes. It is imperative that they should be aware of both the normal and abnormal laboratory values to be able to make decisions about clinical management of the woman.

Heart and Vessels

Pregnancy causes changes in the appearance and function of the heart and great vessels [2]. Elevation of the hemidiaphragms, which accompanies advancing pregnancy, causes the heart to assume a more horizontal position in the chest, and this results in lateral deviation of the cardiac apex, with a larger cardiac silhouette on chest x-ray and a shift in the electrical axis.The heart does increase in size in pregnancy, but only by about 12%. Cardiac output increases by 30–50%, with most of the increase occurring in the first trimester. Both stroke volume and heart rate increase. The heart rate increases by about 17%, with the maximum reached by the middle of the third trimester (32 weeks). Stroke volume increases by 32%, with the maximum reached by midgestation. After 20 weeks, cardiac output may decrease significantly (25–30%) when the patient lies in the supine position as compared with the left lateral position. This is apparently due to compression of the inferior vena cava by the pregnant uterus with resulting decreased venous return. The distribution of cardiac output is altered as well. At term,17% of the cardiac output is directed to the uterus and its contents, and an additional 2% goes to the breasts. The skin and kidneys also receive additional blood flow compared with the nonpregnant state. Blood flow to the brain and liver may increase. Perfusion of other organs such as the skeletal muscle and gut is unchanged.

Oxygen

Total body oxygen uptake at rest increases by about 30–40 mL/min in pregnancy,or about 12–20% [2]. Most of the oxygen is needed to meet maternal metabolic alterations. The increased oxygen need is met by increased tidal volume alone because the pulmonary diffusing capacity appears to be decreased in pregnancy, and the respiratory rate does not significantly increase. There is a total increase in minute ventilation of 48% at term, which exceeds the need for increased oxygen delivery. This “hyperventilation of pregnancy” appears to be hormonally mediated and results in a decrease in $PaCO_2$ to below 30 mm Hg in normal women. Maternal pH does not change because there is a reciprocal decline in bicarbonate concentration. The net result of these acid-base alterations is facilitation of fetalmaternal CO_2 exchange.

Blood

Both the volume and the composition of the blood change during pregnancy [2]. Plasma volume increases by 40–60%, the bulk of the increase occurring before the beginning of the third trimester. The red blood cell mass also expands, with a total increase of 25% at term. This percentage can be maximized (to about 30%) by iron supplementation. An increase in red blood cell mass occurs throughout pregnancy, but the early—and in some patients disproportionate—increase in plasma volume leads to a dilutional anemia. Normal pregnant women who are not iron-supplemented have hemoglobin concentrations of approximately 11 g/dL at 24 weeks of gestation, with little change until term. Those supplemented with iron have similar hemoglobin concentrations at 24 weeks but manifest an increase in hemoglobin to near-normal at term.

The white blood cell count increases to about 10,000/μL at term. The platelet count may decrease slightly to a mean value of 260,000/μL at 35 weeks of gestation. Platelet levels above 120,000/μL generally are regarded as normal in pregnancy.

Immunity

Pregnant women appear to be at increased risk of certain infections, probably owing to the same immune alterations that allow tolerance of the antigenically foreign placenta [2]. For this reason, reactivation of viral diseases and tuberculosis are more common during pregnancy. Severe complications of common disorders such as varicella and pyelonephritis are also more frequent. Measurable indices of immune function such as white blood cell counts and immunoglobulin levels do not explain the maternal immune dysfunction. Various theories have been offered to explain these observations, but none has achieved general acceptance.

Monitoring

When caring for a critically ill pregnant patient, the question of how to monitor the fetus arises frequently [2]. Monitoring by auscultation of fetal heart tones is considered one of the vital signs in any hospitalized pregnant women. However, continuous fetal heart rate monitoring with an electronic monitor may be indicated in the viable or near-viable fetus (23 weeks and beyond), especially if the maternal condition affects pulmonary or hemodynamic function. Use of the continuous fetal monitor requires personnel skilled in its interpretation.

Fetal monitoring may be especially helpful during special procedures or surgery when maternal position, hypotension, or anesthesia can lead to fetal compromise that could be reversed with changes in position or fluid resuscitation. Fetal heart rate monitoring according to a predetermined schedule (nonstress testing) also may be useful in gauging fetal response to the mother's illness and in determining when fetal compromise may necessitate early delivery. This strategy (as opposed to continuous fetal heart rate monitoring) should be reserved for the stable patient whose underlying condition might result in decreased uteroplacental perfusion or altered placental function.

Obstetrics

An expansion of critical care models has been applied to obstetric medicine which has a unique population of critically ill women [1]. Pregnancy alters maternal physiology with respect to many organ systems with notable changes pertaining to critical care in the hematologic, cardiopulmonary, renal, endocrine and gastrointestinal systems. In addition to providing care to the mother, we have to consider the needs of the unborn child, which most likely has also been affected by the mother's current health status. Addressing the needs of this population of patients requires specific expertise not only on the part of the obstetric physician, but also nursing and additional ancillary staff who may be providing respiratory support or pharmaceutical interventions. Clearly, these patients require a multiteam approach to provide optimal care.

Most obstetricians will concede that pregnancy, with its potential hazards, has the opportunity to produce life-threatening complications. The prior existence of medical disease such as hypertension, diabetes, and autoimmune diseases, to name a few, further complicates the care of mother and child. These and other comorbid medical conditions are becoming more and more prevalent in our obstetric population. The health of our obstetric population reflects that of our nation as a whole, which is changing rapidly secondary to the complications of obesity. The age of our gravidas has also increased, thereby increasing the likelihood of comorbid disease. Further affected are the gravidas, both young and old, with pregnancies that resulted from infertility treatments, with the potential for high-order multiple gestations contributing to pregnancy risks.

Primary Care

Within a rapidly changing political and economic environment lies the fundamental need to provide continuity of patient care to decrease morbidity and mortality [5]. Not all women need the same care and an attempt should be made by the clinician to focus on issues specific to high-risk categories and age-related variables. Additionally, scientific and economic documentation of the effectiveness of medical care has become an important issue in both clinical settings and policy-making situations. These concepts will also dictate physician reimbursement.

Periodic health maintenance implies the provision of health services generally considered to be part of primary care, but primary care must be differentiated from the confusing variety of other services, which are specialty specific. For example, "family care" would include a wide range of services to all family members regardless of age or sex and is characteristic of the practice of family medicine. "Comprehensive care" implies that all medical needs can be offered by a single provider, which is not a reasonable expectation. It is well recognized that all physicians who provide primary care services have limitations that depend on the content of their individual educational backgrounds and the scope of their subsequent practice experience. Periodic health maintenance for the gynecologist identifies a component of primary care that we can implement based on expertise acquired through our training as health care providers to women. Some of our health care provision may supersede issues of medical specialty, enabling us to provide for health maintenance and disease prevention.

Nursing

The essence of critical care nursing lies not in special environments nor amid special equipment, but in the nurse's decision-making process and a willingness to act on those decisions [6]. The critically ill obstetric patient requires specialized care directed not only at her identified pathophysiological problems, but also at psychosocial and family issues that become intimately intertwined.

Standards are the basis for nursing practice. They are an important benchmark against which registered nurses assess their professional practice and by which the quality of practice may be judged. In the USA a variety of sources establish and define standards including local and state statutes (nurse practice acts), the American Nurses Association (ANA), national professional nursing organizations, documentary evidence, established references, and expert witness testimony. In other countries similar bodies take on these responsibilities.

Nursing is a dynamic profession that has undergone significant change over time. Thus, regardless of their source, standards should be dynamic to reflect the current state of knowledge applicable to nursing practice.

Technological adjuncts are an integral part of providing care to selected critically ill obstetric patients. Examples of such critical care technology include invasive hemodynamic monitoring and mechanical ventilation. Thus, critical concepts related to use of invasive hemodynamic monitoring and mechanical ventilation during pregnancy are presented.

Childbirth

Although childbirth is a wonderful and enjoyable experience by most, it still is an anatomically traumatic event, associated with tissue injury, vascular disruption and the potential for blood loss [7]. All deliveries are accompanied by physiologic hemorrhage from the genital tract, and the abdominal soft tissue in cesarean section. Post partum hemorrhage (PPH) is an obstetrical complication, which can transform a normal physiologic process of labor and delivery into a life-threatening emergency within minutes. A routine cesarean section can be complicated by massive hemorrhage. The healthy mother may quickly become a patient in the critical care unit, requiring all of the available skill and resources of physicians, nurses, the medical laboratory and the blood bank for survival. A thorough knowledge of the risk factors, preventive strategies, approach to diagnosis and management of PPH are required to properly care for women presenting for delivery. Once PPH is diagnosed, hospital facilities and/or referral centers, laboratories and blood banks must be readily available to provide the optimal chance for a successful outcome. The availability of blood replacement and modern critical care are major determinants of survival in women who develop post partum hemorrhagic shock. Mortality from PPH is strongly correlated with substandard care. Clearly, it is the problem of PPH that most vividly illustrates the difference, worldwide, between management of the puerperium in developed countries from that in underdeveloped countries. Good prenatal care to detect and treat correctable risk factors and active management of the third stage of labor can usually prevent PPH.

EBM

EBM (evidence-based medicine) advocates that decision making should not be based on a clinician's opinion or expert belief that may be limited by gaps in knowledge or by biases, but on the scientific evidence supplemented by all available data [8]. Therefore, publication of clinical guidelines describing the standard treatment along with evidence levels has been greatly needed for daily practice, and for years many physicians have enthusiastically been involved in RCTs (randomized controlled trials) to seek the necessary scientific evidence. For the most part, such great efforts have resulted in success for establishment of novel treatments as standard ones. For example, in development of the standard chemotherapy for epithelial ovarian cancer, so many RCTs have been conducted and currently the combination chemotherapy with triweekly paclitaxel and carboplatin (TC) has been standard for first-line treatment. Numerous patients with postoperative or recurrent ovarian cancer participated voluntarily in those RCTs not for themselves but for future patients. Thus, we have to continue our efforts to seek the scientific evidence that will be adopted in clinical guidelines and used for daily decision making in clinical practice.

Nevertheless, there have been many critical opinions of EBM expressed to date. Before the era of EBM, the understanding of basic pathophysiologic mechanisms of disease coupled with clinical experience was of primary importance in medical teaching and clinical medicine. Because some of the original EBM proponents mistakenly touted EBM as a revolutionary new paradigm disregarding the philosophic basis for

medicine, EBM was thought to be unscientific. Although the strongest recommendations have been made by use of RCTs and meta-analyses in EBM, studies have failed to show that they are consistently more than "good quality". Similarly designed RCTs frequently disagree with one another, and cohort studies with better quality often disagree with those from RCTs. Actually, EBM may be able to answer clinical questions suited to the evidence but not in questions specific to small patient populations or subjective evaluations. Clinically important details may be hidden, because EBM does not integrate non-statistical forms of medical information such as professional experience and patient-specific factors. Also, EBM may reduce the autonomy of the doctor-patient relationship. At the beginning of the era of EBM, it was clearly declared that EBM is not "cookbook medicine" and should not be applied to restrict options of the patient or doctor, which would be "misuse of EBM". However, EBM has been hijacked by accountants and managers to cut the cost of health care. Under the clinical guidelines, EBM has been used to prevent physicians from being held hostage and unable to treat a willing patient while waiting for statistical evidence.

Palliative Care

To achieve good pain and symptom management, palliative care must be patient and family centered [9]. To achieve this centered care, the health care team must understand the patient's goals of care. A goal of care discussion involves exploring the personal values and treatment preferences of a patient in light of the diagnosis of a serious condition. The patient's goals of care frame their pain and symptom management and dictates the priority and aggressiveness of their care.

Related to the patient's goals of care is their expectation. Complete symptom control is at times not possible or practical. Setting realistic expectations for the patient, family, and even health care professionals is important both at the outset and as their disease progresses. When pain and symptoms cannot be eliminated, the emphasis shifts to living with the symptom and managing the problems to optimize the patient's function or quality of life. The patient's survival prognosis may change their goals and expectations and therefore their pain and symptom management.

Many therapies are available to provide pain and symptom management to women with gynecological malignancies. Good symptom management requires a systematic approach based on the mechanism of the symptom. Palliative care can improve the quality of life for cancer patients throughout the entire course of their illness. Physicians who care for these women should have a basic competency in palliative care and be able to refer more complex or complicated cases to their palliative medicine colleagues.

Molecular Research

Molecular investigation, carried out in detail by the researcher, will permit the identification of subgroups of patients to be treated more or less conservatively, taking into consideration the "state of health" of the genes and the proteins [10]. From this "state of health," it should be understood precisely, which neoplasias will respond efficaciously to chemotherapy or surgery and which, will not respond. The clinical management of patients should therefore understandably be influenced by this knowledge. The biological distinctiveness of the pathology must modify the attitude of the clinician. It is therefore necessary that medical updating take place at many levels, expanding the horizons of one's speciality beyond those considered insurmountable until a few years back. In order to completely take advantage of the theoretical results obtained, it is essential that the updating of the clinician is continuous, and completely well rounded with special attention being paid to the achievements of the pathologist and researcher.

In particular, in daily practice, the jobs of the clinician, the pathologist, and the researcher have to be united as much as possible through the creation of mixed units with the same objectives. It is no longer the various specialities, which condition the creation of work groups, but instead the common fields of interest, which bring together professional figures coming from different fields of interest. Wherever these research units have been constituted, the results are tangible both in terms of clinical care and research. The creation of work groups made up of gynecologists, pathologists, molecular biologists, oncologists, and radiotherapists has profoundly modified the treatment protocols of gynecological neoplasias. Meetings are held weekly during which clinical cases are discussed, problems linked to research under way are addressed, updating takes place in a continuous and reciprocal manner by comparisons with the international literature. Other than the increase in clinical care, this has led to a notable improvement of the quality of teaching offered to residents. Only in this way, through close collaboration, clinical and basic research, and patient care can offer better results.

The way of curing cancer has therefore changed because today research is part of the cure. Because through analysis of the genetic profile of a cancer cell, molecular medicine is capable of reading the cell's

capacity of growth and diffusion, and simultaneously, its possible response to medical therapy. Therapy is also research. In addition to personalized and less toxic therapy, innovative therapies have also been introduced because the transfer of research data to the clinic is more rapid.

Conclusion

Malignancies are the second most common cause of death for women of generative age, ie women who are planning to become pregnant or are pregnant. With some malignancies, especially in the initial stages of the disease, of which the woman was ill and treated before pregnancy, it is possible to conceive and carry out the pregnancy until the end. A woman who becomes pregnant during treatment for a malignant disease or in whom a malignant disease occurs during pregnancy is a huge problem for doctors - it must be properly assessed what the risk is to the pregnant woman and her unborn child about non-treatment or treatment. If a decision is made about treatment, the right time and modality of treatment should be evaluated. In such situations, sometimes it is necessary to make a decision whose life to save - a pregnant woman or an unborn child.

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