Routine Investigations in the Antenatal Booking Visit: An Epidemiological Survey

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Abstract

Background: The antenatal care investigations is very important to determine the antenatal care problems, manage these problems and decrease the maternal morbidity and mortality.

Aim of Study: Is to identify the medical pattern in the egyptian pregnant women from Kafr El-Sheikh according to the results of the booking test.

Patients and Methods: Cross sectional study was done over 1260 pregnant women from 2015 to 2017 from the outpatient clinic of Obstetrics and Gynecology in Kafr El-Sheikh General Hospital, out of them 260 pregnant women stepped out of the study, all the pregnant women was asked to do the following antenatal care laboratory investigations, complete blood count, random blood sugar, Rh typing, cytomegalovirus (CMV) IgG antibodies, hepatitis B virus surface antigen, hepatitis C virus antibodies, high vaginal swap for bacterial vaginosis, urine analysis, all the data gathered for each woman in a file with her name for the statistical analysis.

Results: Percentage of anemia was 47.1% with negative significant correlation with age, percentage of DM was 8.1%, percentage of Rh negative was 12.6%, percentage of CMV IgG was 85.7%, percentage of HBV was 2.4%, percentage of HCV was 7.9% with positive significant correlation with history of previous CS, percentage of bacterial vaginosis was 27% and percentage of UTI was 62%.

Conclusion: A lot of women in Kafr El-Sheikh do not know the importance of the antenatal investigations and the control of the antenatal problems.

Recommendations: There is need for give more concern about routine antenatal care investigations and it's importance and routine screening for anemia, DM, Rh, CMV, HBV, HCV, BV and UTI.

Key Words: *Antenatal care – Anemia – Diabetes mellitus – Rh negative – Cytomegalovirus IgG – Hepatitis B virus – Hepatitis C virus – Bacterial vaginosis – Urinary tract infection.*

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Introduction

ANTENATAL Care (ANC) means "care before birth", and includes education, counseling, screening and treatment to monitor and to promote the well-being of the mother and fetus. The current challenge is to find out which type of care and in what quantity is considered sufficient to ensure good quality of care for low-risk pregnant women [1].

The recommended content of antenatal care according to (NICE, 2007):

A- Antenatal education.

B- Provision and organization of care.

C- Lifestyle considerations.

D- Management of common symptoms of pregnancy.

E- Clinical examination of pregnant women.

F- Screening for hematological conditions.

G- Screening for infections.

H- Screening for clinical conditions.

I- Fetal growth and wellbeing.

J- Screening for fetal anomalies.

K- Management of specific clinical conditions [2].

Results from a blood type test can show if you have the Rh factor. The Rh factor is a protein that can be present on the surface of red blood cells. Most people have the Rh factor-they are Rh positive. Others do not have the Rh factor-they are Rh negative. If your fetus is Rh positive and you are Rh negative, your body can make antibodies against the Rh factor. In a future pregnancy, these antibodies can damage the fetus's red blood cells [3].

All pregnant women should undergo blood grouping determination. Anti-D (formerly Rh), given to pregnant women within 72 hours after

childbirth, reduces the risk of Rh D alloimmunization in Rh negative women who have given birth to an Rh-positive infant. However evidence of the optimal dose is limited. Higher doses (up to 200 micrograms) have been shown to be more effective than lower doses (up to 50 micrograms) in preventing Rh D alloimmunization in a subsequent pregnancy [3].

Anemia is the most common nutritional deficiency disorder in the world. WHO has estimated that prevalence of anemia in developed and developing countries in women go through a variety of physiological changes during pregnancy. Changes in the blood circulatory system are particularly notable, permitting normal fetal growth. Even in normal pregnant women, the hemoglobin concentration decreases with dilution according to the increase in the volume of circulating blood. Since iron and folic acid in amounts necessary to the fetus are preferentially transported to the fetus, the mother is likely to develop iron deficiency anemia and folic acid deficiency anemia. About 20% of pregnant women suffer anemia, and most of the cases are iron deficiency, folic acid deficiency, or both [4].

Urinary Tract Infections (UTIs) are one of the most frequent complications during pregnancy . Traditionally Urinary Tract Infection (UTI) is classified as either involving the lower urinary tract (acute cystitis) or the upper urinary tract (acute pyelonephritis). A predisposing factor or precursor to UTI is bacteriuria. Smooth muscle relaxation results in decreased peristalsis of the ureters, increased bladder capacity and urinary stasis. Differences in urine pH and osmolality and pregnancy-induced glycosuria and aminoaciduria may facilitate bacterial growth. Urinary tract infections in pregnancy are classified as either asymptomatic or symptomatic. Asymptomatic bacteriuria is defined as the presence of significant bacteriuria without the symptoms of an acute urinary tract infection. Symptomatic urinary tract infections are divided into lower tract (acute cystitis) or upper tract (acute pyelonephritis) infections. Cystitis is defined as significant bacteriuria with associated bladder mucosal invasion, whereas pyelonephritis is defined as significant bacteriuria with associated inflammation of the renal parenchyma, calices and pelvis [5].

Hepatitis B and hepatitis C viruses infect the liver. Pregnant women who are infected with hepatitis B or hepatitis C virus can pass the virus to their babies. All pregnant women are tested for hepatitis B virus infection. If you have risk factors,

you also may be tested for the hepatitis C virus. Mother-to-child transmission of the Hepatitis B (HB) virus is preventable in 95% of cases through administration of vaccine and immunoglobulin to the baby at birth. To prevent mother-to-child transmission, all pregnant women who are carriers of Hepatitis B (HB) virus need to be identified. Blood sample screening is the accepted standard for antenatal screening for Hepatitis B (HB) virus [6].

Newly infected people with Hepatitis C Virus (HCV) are generally asymptomatic, but they may present with mild clinical illness. After exposure HCV RNA is detectable within 1-3 weeks, with the typical time from exposure to Hepatitis C Virus (HCV) antibody seroconversion (anti-HCV) occurring in 8-9 weeks. Chronic Hepatitis C Virus (HCV) infection develops in 70-80% of people infected with Hepatitis C Virus (HCV), and 60-70% of these chronically infected people will exhibit signs of active liver disease. Because most infected people are unaware of their status due to lack of clinical symptoms they can provide risk to others for Hepatitis C Virus (HCV) transmission. People with chronic Hepatitis C Virus (HCV) generally remain asymptomatic for 20-30 years [7]. 20% will develop cirrhosis, and 1-6% will develop hepatocellular carcinoma. The remaining 35% with chronic Hepatitis C Virus (HCV) may die from other morbidities, develop slowly advancing liver disease, or they may continue with persistent Hepatitis C Virus (HCV) infection and stable liver disease [8].

Congenital cytomegalovirus (CMV) infection is the leading cause of infectious congenital defects and disabilities. Its transmission can occur in primary and non-primary infections; however the transmission rate is considerably higher in primary infections. Cytomegalovirus (CMV) is widely distributed among humans. As other viruses of the Herpes viridae family, it causes a primary infection and then remains latent in the body. Despite causing a usually harmless primary infection, cytomegalovirus (CMV) can be life-threatening for immunocompromised patients and can cause serious fetal damages. Hence, infection in pregnant women assumes high importance [9].

Bacterial vaginosis is a syndrome that can be diagnosed both clinically and microbiologically. Diagnostic criteria are the same for pregnant and non-pregnant women. Amsel et al., published clinical diagnostic criteria in 1983, and these are still in use today. The clinical diagnosis of bacterial vaginosis is made if three of the four following signs are present [10].

• An adherent and homogenous vaginal discharge.

• Vaginal pH greater than 4.5.

• Detection of clue cells (vaginal epithelial cells with such a heavy coating of bacteria that the peripheral borders are obscured) on saline wet mount.

• An amine odour after the addition of potassium hydroxide (positive whiff test).

Gram stain of vaginal fluid is the most widely used and evaluated diagnostic method for bacterial vaginosis. To perform a gram stain, vaginal discharge is collected on a glass slide, allowed to air dry, stained in the laboratory, and examined under oil immersion for the presence of bacteria. Most laboratories use an objective diagnostic scheme that quantifies the number of Lactobacillus morphotypes and pathogenic bacteria, resulting in a score that is used to determine whether the infection is present [11].

Untreated gestational diabetes (GDM, an abnormal, pregnancy-related glucose level in the mother) can lead to serious problems for mother and fetus. At present, Gestational Diabetes Mellitus (GDM) screening appears to be hampered by the lack of a clear definition of risk, and agreed diagnostic criteria. Risk factors for Gestational Diabetes Mellitus (GDM) are neither selective nor specific enough, and are therefore useless. However, there is good evidence showing that interventions and treatments, like dietary counseling, blood glucose monitoring, and insulin (if appropriate), lead to improved outcomes for mother and fetus. The best test at present is probably the glucose challenge test, preferably combined with a fasting plasma glucose [12].

Patients and Methods

A cross-sectional study was held in the period from April 2015 to 2017 on 1260 pregnant women who attended the outpatient clinic of Obstetrics and Gynecology in Kafr El-Sheikh General Hospital at their booking antenatal care visit, 260 pregnant women were enrolled out of the study.

All patients were subjected to the following:

• Verbal consent.

• Detailed clinical history.

Personal history, obstetric history, present history, past history, surgical history, general examination.

All the pregnant women was asked to do the following antenatal care laboratory investigations:

• Complete blood count.

• Random blood sugar.

• Rh typing.

• Cytomegalovirus (CMV) IgG antibodies.

• Hepatitis B virus surface antigen.

• Hepatitis C virus antibodies.

• High vaginal swap for bacterial vaginosis

• Urine analysis.

All the data gathered for each women in a file with her name for the statistical analysis.

Results

This study was performed over 1260 pregnant women of whom 260 women refused to be included among this study, so this study was done on 1000 pregnant women.

Table (1): Number and percentage of anemia among studied groups.

Anemia	No.	%
Positive	471	47.1
Negative	529	52.9
Total	1000	100

Table (1) is showing number and percentage of anemia among studied groups as, 471 (47.1%) had anemia while 529 (52.9%) had normal Hb level.

Table (2): Correlation between anemia and age, occupation, parity and labor.

Variable	Anemia
Age:	
r	–0.081
p	0.010*
Occupation:	
r	–0.014
p	0.664
Parity:	
r	0.059
p	0.062
Labor:	
r	0.080
p	0.011*

Table (2) shows that there was negative significant correlation between anemia and age while there was positive correlation between anemia and type of labor.

Table (3): Number and percentage of diabetes mellitus among studied groups.

Diabetes mellitus	No.	%
Positive	81	8.1
Negative	919	91.9
Total	1000	100

Table (3) is showing number and percentage of diabetes mellitus among studied groups as, 81 (8.1%) had diabetes mellitus while 919 (91.9%) were normal pregnancy.

Table (4): Number and percentage of Rhesus gene (Rh) among studied groups.

Rh	No.	%
Positive	874	87.4
Negative	126	12.6
Total	1000	100

Table (4) is showing number and percentage of Rhesus gene (Rh) among studied groups as, 874 (87.4%) out of the patients were Rh positive while 126 (12.6%) out of the patients were Rh negative.

Table (5): Number and percentage of cytomegalovirus (CMV IgG) among studied groups.

CMV	No.	%
Positive	857	85.7
Negative	143	14.3
Total	1000	100

Table (5) is showing number and percentage of cytomegalovirus (CMV IgG) among studied groups as, 857 (85.7%) out of the patients were positive for CMV IgG while 143 (14.3%) out of the patients were negative for CMV IgG.

Table (6): Number and percentage of Hepatitis B Virus (HBV) among studied groups.

HBV	No.	%
Positive	24	2.4
Negative	976	97.6
Total	1000	100

Table (6) is showing number and percentage of Hepatitis B Virus (HBV) among studied groups as, 24 (2.4%) out of the patients were positive HBV while 976 (97.6%) out of the patients were negative HBV.

Table (7): Number and percentage of Hepatitis C Virus (HCV) among studied groups.

HCV	No.	%
Positive	79	7.9
Negative	921	92.1
Total	1000	100

Table (7) is showing number and percentage of Hepatitis C Virus (HCV) among studied groups as, 79 (7.9%) out of the patients were positive HCV while 921 (92.1%) out of the patients were negative HCV.

Table (8): Correlation between Hepatitis C Virus (HCV) age, occupation, parity and labor.

Variable	HCV
Age:	
r	0.056
p	0.076
Occupation:	
r	0.015
p	0.634
Parity:	
r	0.354
p	0.000*
Labor:	
r	0.137
p	0.000

Table (8) show that there was positive significant correlation between Hepatitis C Virus (HCV) and parity and type of labor.

Table (9): Number and percentage of bacterial vaginosis among studied groups.

Bacterial Vaginosis	No.	%
Positive	270	27
Negative	730	73
Total	1000	100

Table (9) is showing number and percentage of bacterial vaginosis among studied groups as, 270 (27%) out of the patients were positive for bacterial vaginosis while 730 (73%) out of the patients were negative foe bacterial vaginosis.

Table (10): Number and percentage of Urinary Tract Infection (UTI) among studied groups.

Urinary tract infection (UTI)	No.	%
Positive	620	62
Negative	380	38
Total	1000	100

Table (10) is showing number and percentage of Urinary Tract Infection (UTI) among studied groups as, 620 (62%) out of the patients had positive pus cells while 380 (38%) out of the patients had negative pus cells.

Discussion

In 2015, an estimated 303 000 women died from pregnancy-related causes and 2.6 million babies were stillborn, half occurring during the third trimester. Many of these adverse outcomes can be prevented by quality healthcare during pregnancy and childbirth. Within the continuum of care, antenatal care (ANC) provides a platform for critical healthcare functions including health promotion, prevention, screening and diagnosis of diseases. Implementing timely and appropriate evidence-based practices during antenatal care (ANC) can improve maternal and fetal health. Furthermore, it is an opportunity to communicate with and support women, families and communities at this very pivotal time in the course of their lives [13].

The percentage of anemia in Kafr El-Sheikh is 47.1 %, it was reported before in other studies in Egypt to be 62.2% [14], 52.5% [15] and it is also reported in 2014 by the world bank health nutrition and population statistics that it declines in Egypt from 35.9% to 30.4%. This decline in percentage of anemia may be due to the use of iron and folic acid supplement and strengthened health educations given at health centers and also due to the time difference [15].

In our study there was negative significant correlation between anemia and age of pregnant women as anemia is 37.9% among women aged 20-30 years as it is the main reproductive age so repeated pregnancies with depletion of iron stores through short period of time, repeated deliveries with repeated blood loss and a lot of duties making pregnant women neglect eating properly so among our study most of pregnant women belong to this group of age and that is similar to other studies as [16] which revealed that anemia found to be more prevalent in women aged between 21-30 at 39.1% as compared to 29.8% in the 15-20 year age group and 29.9% in the above thirty age group, and [17] which revealed that anemia found to be more prevalent in women aged between 20-29 at 239 pregnant women as compared to 42 in the under twenty age group and 147 in the 30-34 age group.

There was significant correlation between anemia and type of labor as it was found to be more with caesarean section more than normal labor as shown in other study [18] which found that anemia is more with the history of surgical operations, also it is because blood loss after caesarean section is more than blood loss after normal vaginal delivery as shown in other study [19] which found blood loss after caesarean section is about 1200-1500ml while with normal vaginal delivery is about 500ml.

In our study, 81 case have diabetes with pregnancy and percentage was 8.1 %. Diabetes with pregnancy (DM) was reported in another study in Egypt as it was 8% [20].

The percentage of diabetes with pregnancy in our study is intermediate according to the results published by the national institution of health as it reported that diabetes with pregnancy percentage ranges from 4.9% to 12.8% [21], and the percentage of diabetes with pregnancy in our study was exactly similar to a study have been done in china which was 8.1 % [22].

In our study, Rhesus gene positivity percentage among pregnant women was 87.4% while Rhesus gene negativity percentage was 12.6%. It is in the same range of other studies as it was in Nigeria 7.1% [23], other study in Nigeria 9.5 [24], in Ethiopia 8.8% [25].

In current study, the percentage of cytomegalovirus immunoglobulin class G (CMV IgG) was 85.7%, it was reported before in Egypt that cytomegalovirus immunoglobulin class G (CMV IgG) among pregnant women was 97% [26] and 75.1% [27] and it have been reported that, Africa have one of the highest prevalence of CMV as in Egypt, CMV seroprevalence among pregnant women was 96% [28]. This high percentage may be attributed to the low socioeconomic status, poor hygienic practices, lack of education about washing hands, which might play important roles in increasing the rate of cytomegalovirus (CMV) infection it is similar to other studies in other countries such as in Brazil was 84% [29].

In our study, the percentage of Hepatitis B Virus (HBV) infection among the pregnant women from Kafr El-Sheikh was 2.4%. This percentage was in the same range of other study in Menoufia as it was 2.3% [30], it was lower than previous studies in Assuit which was reported in 1993 to be 14.7% [31] and in 2010 it was 4% [32], while in cairo the percentage of hepatitis B virus infection among pregnant women was lower than all of that as it was reported in 2013 to be 1.7% [33] and this may be due to the more awareness and education of the people, the higher socioeconomic conditions

in cairo, the more hygienic environment and lower bad behavioral and cultural practices [33].

In our study, the percentage of Hepatitis C Virus (HCV) infection among pregnant women in Kafr El-Sheikh General Hospital was 7.9% which was similar to other studies in Egypt as it was reported to be 8.6% in 2010 [34], between 5-15% in 2013 [35] and 6.1% in 2014 [36]. It was higher than other study as it was 1.46% in Upper Egypt in 2016 [37]. It was lower than other study as in El-Behira, Egypt was 10.4% in 2015 [38].

In the current study it is reported that bacterial vaginosis among pregnant women in Kafr El-Sheikh General Hospital was 27%. It was reported globally in Gideon book to be 33.3% in Egypt [39]. This high percentage of bacterial vaginosis among pregnant women in Kafr El-Sheikh may be due to the low socioeconomic level, low hygienic level, and the unawareness of the women about the abnormal vaginal secretions and proper personal hygiene as wiping from front to back [40].

The percentage of Urinary Tract Infection (UTI) among pregnant women in our study was 62%. It was reported before in Egypt to be 32% [41], 31.3% and within the range of 22-35% [42], this high percentage was explained to be due to the physiological changes associated with pregnancy, such as the relaxation of the ureter under the effect of hormones, increase the urinary output, resulting in urinary stasis [43].

Conclusion and Recommendations:

There is need for give more concern about routine antenatal care investigations and it's importance and routine screening for anemia, DM, Rh, CMV, HBV, HCV, BV and UTI.

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الفحوصات التقليدية فى الزيارة التسجيلية لمتابعة الحمل:
دراسة مسحية

"الرعاية قبل الولادة" تشمل التعليم والإرشاد والفحص والعلاج لرصد وتعزيز رفاهية الآم والجنين.

الهدف من هذه الدراسة المقطعية هو تحديد الطابع الطبى للنساء الحوامل بكفر الشيخ بناء على نتائج الزيارة الآولى لمتابعة الحمل.

طلب من جميع النساء الحوامل إجراء التحاليل المعملية التالية لرعاية ما قبل الولادة:

١– صورة دم كاملة.

٢– قياس سكر عشوائى بالدم.

٣– فصيلة الدم وعامل (ريساس).

٤– تحليل بول.

٥– فيروس إلتهاب الكبد ب.

٦– فيروس إلتهاب الكبد ج.

٧– فيروس مضخم للخلايا (CMV).

٨– مسحة من الإفرازات المهبلية لتشخيص داء المهبل الجرثومى.

كشفت الدراسة آن فقر الدم لدى النساء الحوامل فى كفر الشيخ هو بنسبة ٤٧.١٪ ويبلغ معدل الإصابة بسكرى الحمل ٨.١٪ ونتيجة عامل ريسوس السلبية هى ١٢.٦٪ ونسبة الفيروس المضخم للخلايا هى ٨٥.٧٪ وبلغت نسبة الإصابة بفيروس إلتهاب الكبد الوبائى بى ٢.٤٪ وعدوى الإلتهاب الكبدى الوبائى سى ٧.٩٪ ونسبة إلتهاب المهبل البكتيرى هى ٢٧٪ ونسبة إلتهاب المسالك البولية هى ٦٢٪.

يوصى بإعطاء إهتمام آكبر للرعاية والفحوصات الروتينية لما قبل الولادة.