Introduction

Maternal smoking in pregnancy is associated with adverse pregnancy outcomes, including an increased risk for preterm birth, placental abruption, placenta previa and low birth weight. The reductions in neonatal weight observed with maternal smoking may have life-long consequences because evidence points to significant pediatric and adult morbidity associated with reduced birth weights ***(Bernstein et al., 2005)***.

The timing of reduction in maternal cigarette consumption during pregnancy has been specifically evaluated relative to its association with birth weight, the results of some studies have suggested that early pregnancy cessation of smoking has the greatest impact on birth weight, pointing to a relatively small impact of third trimester level on birth weight, whereas others have suggested that third-trimester maternal cigarette consumption has the strongest association with birth weight ***(England et al., 2001b)***. Moreover, infants born to women who stopped smoking had higher birth weights than did those born to women who reduced smoking or who did not change behavior ***(Shankaran et al., 2004)***.

The major metabolites of nicotine are continine and nicotine-1-N-oxide, which are formed respectively from oxidation of the α-carbon and N-oxidation of the pyrrolidine ring ***(Goodman and Gilman, 1996)***. ***Pichini et al., (2000)*** reported that cotinine concentration in cord serum can be used

to assess exposure to prenatal environmental tobacco smoke (ETS) in newborns during a period of several days.

Therefore, smoking during pregnancy is a preventable cause of reduced birth weight, preterm delivery and increased perinatal mortality ***(England et al., 2001a)***. Unfortunately nearly half of all women who smoke continue to do so throughout their pregnancies ***(Wakschlag et al., 2002)***.

Aim of the work

This study is designed to evaluate the level of cord serum continine in relation to neonatal gestational age, Apgar score and anthropometric measurements.

Smoking

Smoking is a major world-wide public health problem. The Period from early teens to early twenties is a critical period in which the majority of individuals begin to develop the social pattern that will cause them to start smoking or to become smokers later on in their lives ***(Azab et al., 1995)***.

All smokers face an increased risk of lung cancer, other lung diseases, and cardiovascular and other disorders, smoking during pregnancy can harm the health of both the woman and her baby, despite the fact that generally the number of smokers has declined, the number of heavy smokers has practically doubled in the last 10 years and more so in women than men ***(Martin et al., 2006)***.

This statistic is of particular interest because it has been proven that the more cigarettes a woman smokes throughout her pregnancy, the more the unborn child will be affected or harmed, not only could the correct development of the baby's body be at risk, but so could the development of its brain and its health, these problems could have a lifetime impact on the child, possibly staying with him well into adulthood ***(Martin et al., 2006)***.

Tobacco smoke is a known to be toxic to humans. It contains over 3,000 chemicals of which over 200 are regarded as poisons and 50 as possible carcinogens, it is generally accepted that there is no safe level of exposure to cigarette smoke ***(Grazuleviciene et al., 2009)***.

Tobacco was first used by the peoples of the Pre-Colombian American. Native Americans apparently cultivated the plant and smoked it in pipes for medicinal and ceremonial purposes ***(CNN-interactive, 2000)***.

Christopher Columbus brought a few tobacco and seeds with him back to Europe, but most Europeans didn't get their first taste of tobacco until the mid 16th century when adventures and diplomats like France's jean Nicot-for whom nicotine is named –began to popularize its use ***(CNN-interactive, 2000)***.

Smoking was introduced to the Muslim countries by the Europeans around 1000AH. Its spread among the Muslims was similar to that in the west. The unfortunate fact, however is that in the Muslims countries, no similar measures were exerted to protect the people from it, to the contrary, the media continues to adorn smoking and encourage people to do it. This caused the epidemic of smoking to continue to spread in these countries to such extent that it has become hard to control ***(AL-Jibaly, 1996)***.

Incidence and Prevalence:

Tobacco is still widely used by women of childbearing age. Based on 2000 and 2001 combined data of the National Household Survey on Drug Abuse in New York, 19.8% of pregnant women aged 15 to 44 smoked cigarettes in the past month compared with 29.5% of non pregnant women of the same age group. The trend has increased from 1999 and 2000 in

which 17% of pregnant women were current smokers ***(Wilkinson et al., 2001)***.

Wilkinson and his colleagues (2001) found that pregnant women aged 15 to 25 were twice as likely to have smoked cigarettes in the last month compared to women aged 26 to 44, most of those who smoked during pregnancy were Caucasian. About 23.6% of current smokers smoked during the first trimester, 23.8% continued to smoke during the second trimester and 17% up to third trimester.

The world health organization has estimated that the health of almost half of the world's children is threatened by exposure to environmental tobacco smoke, in the united states the prevalence of US children living in homes with a smoker has been estimated to be 43%, this increase children's risk of respiratory tract infections, otitis media, asthma and the sudden infant death syndrome (SIDS) ***(Hovell et al., 2000)***.

Most published research on smoking during pregnancy comes from developed countries ***(WHO, 1994)***, in the United States and other industrialized countries, 18% of women smoke ***(CDC, 2007)***, currently at least 10% of women in the United States smoke during pregnancy ***(Martin et al., 2006)***, this proportion is somewhat smaller in developing countries where only 8% of women smoke ***(WHO, 2001)***.

According of Pregnancy Risk Assessment Monitoring System (PRAMS, 2004) data from 26 states demonstrated

prevalence of smoking during the last 3 months of pregnancy as follow: ***(CDC, 2007)***.

i- Approximately 13% of women reported smoking during the last 3 months of pregnancy.

ii- Younger, less educated non-Hispanic white and American Indian women are more likely to smoke during pregnancy compared with older educated counterparts.

iii- Women on Medicaid are more than three times as likely to smoke during the last 3 months of pregnancy as women with private insurance, and smoking rates are higher among women who enter into prenatal care later in pregnancy.

iv- Of women who smoked 3 months before pregnancy, 45% quit during pregnancy, among quitters during pregnancy, 52% relapsed within 6 months after delivery ***(CDC, 2007)***.

The International Child Care Practices Study concluded in a survey of 21 centers in 17 countries that an average of 22% of mothers and 45% of fathers were smoking at the time of their child's birth, although the geographical variations are large, this most likely represents the single largest modifiable neuropharmacological exposure for the fetus ***(Nelson and Taylor, 2001) and (Wickstrom, 2007)***.

Chaaya et al., (2003) preformed a cross- sectional study in Lebanon to assess the prevalence of smoking prior to and during pregnancy. The prevalence of pre-pregnancy smoking

among women in different hospitals studied and among geographic areas was comparable, of the women studied 28% were pre-pregnant smokers, however there were statistical differences in smoking during pregnancy among women who delivered in Beirut versus those in the suburbs, 19% of women in Beirut and 21% of those in the suburbs smoked cigarettes after they knew they were pregnant.

The developed world has lately experienced a tangible decrease in the overall smoking prevalence as a result of multiple preventive measures; these include workplace or community smoking bans, statewide taxes on tobacco, and anti smoking media campaigns ***(Ebrahim et al., 2000)***.

In addition to individual cessation strategies, by contrast, the smoking prevalence in Lebanon and other developing countries has shown a steady rise over the past several years, such rise may be partially due to a growing social acceptability to various types of tobacco smoking namely cigarettes and argileh ***(Ebrahim et al., 2000)***.

It appears that despite increased information regarding the health risks of cigarette smoking, women continue to smoke during pregnancy and most find it difficult to quit. In Germany, 13% of women smoke during pregnancy, and there appears to be an inverse association of smoking frequency with maternal age, where 34% of pregnant women under 20 years of age smoke, rates of smoking during pregnancy in Norway are similar to those in Germany at 13.2% ***(Kvalvik et al., 2008)***.

A Canadian study showed that 70% of women who smoked prior to pregnancy continued to do so at the time of delivery, moreover in the USA, under 26% of female smokers will abstain from smoking during pregnancy, and as many as 10.7% of all pregnancies are exposed to maternal tobacco consumption ***(Reevs and Bernstein, 2008)***.

Epidemiology of smoking in Egypt:

Women from low socioeconomic classes had more intense and longer exposure than women from higher socioeconomic classes, mainly because of work exposure ***(Curtin et al., 1998)***.

Prevalence of smoking is higher in urban than in rural areas, where only men used to smoke, however the proportion of women who smoke was rising in Egypt ***(Mahfouz, 1984)***.

Tag El Din (1993) reported a highly significant difference between males and females Egyptian smokers as males represent 86.12% and females represent only 13.88 %. Social norms, culture and religion of oriental society, were proposed to be the factors lowering the percent of female smokers.

On studying prevalence ***Talaat (1999)*** reported that 439.000 of cigarette smokers in Egypt are children less than 10 years of age.

Types of Smoking:

1-Active smoking:

An active smoker is any one who reports during the first clinic visit that he or she smoked any number of cigarettes ***(Ahluwalia et al, 1997)*** and ***(Horta et al., 1997)***.

2-Passive smoking:

Passive smokers are individuals who had been exposed to passive smoke at least one hour/day for at least twelve consecutive months during their life time ***(Morabia et al., 1996)***.

Secondhand smoke:

According to (American Lung Association), secondhand smoke also known as environmental tobacco smoke (ETS), or passive smoke is a mixture of the smoke given off by the burning end of a cigarette, pipe or cigar and the smoke exhaled from the lungs of smokers, it is involuntarily inhaled by nonsmokers, lingers in the air hours after cigarettes have been extinguished and can cause or exacerbate a wide range of adverse health effects including cancer, respiratory infections and asthma ***(California Environmental Protection Agency, 2005)***.

Secondhand smoke has been classified by the Environmental Protection Agency (EPA) as a known cause of

cancer in human (Group A carcinogen), when a person lights up a cigarette, the non smoker breathes smoke from the burning tip of the cigarette and "mainstream" smoke that has been inhaled and then exhaled by the smoker ***(Meleigy, 2007)***.

"Sidestream" smoke contains more than 4000 chemicals, including tar, carbon monoxide and 69 known carcinogens (cancer causing substances) such as formaldehyde, lead, arsenic, benzene and radioactive polonium 210, several carcinogens have been shown to be present at higher concentrations in midstream smoke than mainstream smoke in part because passive smokers don't gain the benefit of the filter ***(Meleigy, 2007)***.

Method of tobacco smoking:

1-Snuff:

Snuff is powdered tobacco mixed with other substances; prolonged use causes atrophy of the nasal mucous membrane with replacement of ciliated columnar by squamous epithelium. Some kinds used in Africa may be locally carcinogenic ***(Laurence and Bennett, 1998)***.

2-Cigars and pipes:

These methods have alkaline pH (8.5) and nicotine is relatively unionized and lipid soluble so that it is readily absorbed in the mouth, Cigars and pipe smokers thus obtain

nicotine without inhaling (They also have a slower death rate from lung cancer) ***(Laurence and Bennett, 1998)***.

3-Cigarettes:

They are acidic (pH 5.3) and nicotine is ionized and insoluble in lipids, most cigarettes contain 6 to 8 mg of nicotine ***(Herfindal and Gourley, 2000)***.

Desired amounts of nicotine are only absorbed if it is taken into the lungs where the enormous surface area for absorption compensates for the relative lipid insolubility, the amount of nicotine absorbed from tobacco smoke varies from 90% in those who inhale to 10% in those who do not.***(Laurence and Bennett,1998)***.

4-Chewing tobacco:

Nicotine in chewing tobacco is more slowly absorbed than inhaled nicotine, so it has a longer duration of effect ***(Goodman and Gilman, 1996)***.

5-**Gum containing nicotine:**

This is used in cessation program, gum contains 2 mg nicotine bound to ion exchange resin, nicotine is absorbed through buccal mucosa, the patient must be instructed to chew slowly, chewed at a rate of one piece / hour to avoid swallowing, the blood level of nicotine does not reach the trough level obtained by smoking and cardiovascular effects are

minimal, the drug should be used with caution in patients with recent myocardial infarction ***(Goodman and Gilman, 1996)***.

6-Narghile (Hubble-Bubble) smoking (shisha):

Narghile smoking, also known as water pipe, shisha, hookah or hubble-bubble smoking, is common among the men and women of several non –western countries, the tobacco is placed on a tray situated on a bottle half-filled with water, a tube stemming from the tray is submerged under the water, the tobacco is burned directly by a piece of charcoal, and the smoke passes through the water before being inhaled through a long flexible tube attached to the bottle ***(Nywayhid et al., 1998)***.

Smokeless tobacco (chewing tobacco, oral moist snuff and mishri):

The possible adverse health effects of smokeless tobacco during pregnancy have received far less attention with a limited number of publications addressing this practice, characterization of this association is however important for several reasons:

- Firstly, millions of pregnant women use smokeless tobacco, predominantly in Africa and Asia, but also in Scandinavia, these women are not exposed to the combustion products in tobacco smoke (e.g. carbon monoxide and cyanide) that may contribute to fetal hypoxia and reduced birth weight, but as nicotine levels may be very high the fetal exposure to nicotine may be unaltered or even increased.

- Secondly, as the hazards of smoking during pregnancy have become more evident in recent years, pregnant women are in rapidly increasing numbers turning to other forms of nicotine. Therefore, the use of smokeless tobacco during pregnancy is an important clinical issue also for other countries than those primarily affected today ***(Wickstrom, 2007)***.

Hazards of Smoking

Maternal smoking during pregnancy is the most common prevalent cause of health hazards to the fetus ***(Windham et al., 1999)***, also, ***Zdravkovic and his colleagues (2005)*** reported that cigarette smoking has many negative effects on both the mother and fetus during pregnancy, discontinuation of smoking can have many long-term benefits for both.

Despite current knowledge about the detrimental effects of smoking during pregnancy, the reduction in smoking among pregnant women is progressing very slowly. In some regions, e.g. Sweden, smoking has decreased at a higher rate and is now below 10% ***(Styrelsen, 2006)***.

This decrease is however often coupled to a simultaneous increase in the use of smokeless tobacco, resulting in virtually unaltered levels of nicotine exposure for the fetus ***(Styrelsen, 2006)***.

Also, ***Wickstrom (2007)*** reported that although knowledge about the negative effects on the fetus and the newborn of smoking during pregnancy is getting increasingly widespread, this habit still remains a great problem worldwide.

Maternal smoking during pregnancy produces adverse effects for the fetus through several pathways:

First, cigarette smoke interferes with normal placental function. As metabolites of cigarette smoke pass through the