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Relation Between Maternal Smoking and Children's Low Birth Weight.

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Abstract: -

Maternal smoking has always been associated with a variety of different diseases some of which are Alzheimer's, many forms of cancer and also depression and low BMI at birth. This report will primarily aim to discuss the association between maternal smoking on their children's low birth weight chances, and secondarily it will also discuss it here in Libya although this isn't a major problem for us here in Libya because there aren't many first hand Libyan mother smokers but a large percentage of Libyan fathers smoke in the same place as their wives so the mothers are considered second hand smokers, and second smoking is believed to be as bad or worse from first hand smoking. So this report will try to discuss how second hand smoking for Libyan mothers can lead to the giving birth to low birth weight children.

Introduction: -

The relevance of birth weight as an indicator of a newborn's future health is well established in the literature. Birth weight has been linked to neonatal and infant mortality [1], and, later in life, to intellectual impairment [2], and to specific morbidities including obesity, coronary heart diseases, type-2 diabetes, hypertension, metabolic syndrome, among others [3]. Low birth weight increases the risk of premature adult mortality. In addition to some normal variation; offspring birth weight is a result of the mother's nutritional status and lifestyle [4], which are influenced by the mother's cultural and socioeconomic circumstances [5]. Smoking during pregnancy (SDP) is considered the single most important determinant of decreased birth weight [6]. Empirical evidence shows that SDP reduces birth weight by 200 to 377 g, depending on daily consumption (larger reduction for heavy smokers) and the trimester in which exposure occurs (larger reduction during the last trimester) [7]. Most first hand smokers know the horrible side effects of smoking from different forms of Cancers which may be as severe as life threatening to a simple bad breathe which could be solved by a piece of gum or a mint, but most second hand smokers don't. Secondhand smoke (SHS) is also called *environmental tobacco smoke* (ETS). It's a mixture of 2 forms of smoke that come from burning tobacco **Mainstream smoke which is** The smoke exhaled by a smoker and **Side stream smoke which is** Smoke from the lighted end of a cigarette, pipe, or cigar, or tobacco burning in a hookah. This type of smoke has higher concentrations of cancer-causing agents (carcinogens) and is more toxic than mainstream smoke. It also has smaller particles than mainstream smoke. These smaller particles make their way into the lungs and the body's cells more easily. When non-smokers are exposed to SHS it's called *involuntary smoking* or *passive smoking*. Non-smokers who breathe in SHS take in nicotine and toxic chemicals the same way smokers do. The more SHS you breathe, the higher the levels of these harmful chemicals in your body.[8]

Discussion:-

This discussion will include three studies supporting the relation between Maternal smoking and its relation with low children birth weight, and it will also include a study proving the relation between first hand smoking and second hand smoking. The first study was done in Sweden. Using the Swedish Medical Birth Register identified 677,922

singletons born between 2002 and 2010 from native Swedish mothers. From this population, we isolated 62,941 siblings from 28,768 mothers with discrepant habits of SDP. We applied conventional and mother-specific multilevel linear regression models to investigate the association between maternal SDP and offspring birth weight. Depending on the mother was light or heavy smoker and the timing of exposition during pregnancy (i.e., first or third trimester), **Continuous smoking during pregnancy:** - The conventional analysis showed that heavy smokers experienced the highest reduction in birth weight (303 g), followed by those who were light smokers in the 1st trimester and those who became heavy smokers in the 3rd trimester (265 g reduction). This gradient was completed by heavy smokers in the 1st trimester who became light smokers in the 3rd trimester (254 g reduction) and those who remained light smokers throughout the entire pregnancy (221 g reduction). The results from the sibling analysis were analogous to those from the conventional analysis, although the birth weight reduction in the sibling analysis was smaller for almost all categories of smoking than in the conventional analysis. The greatest differences between designs were observed in the categories of heavy-heavy and light-light, with reductions of 226 and 162 g, respectively. After applying the sibling analysis, the effect of heavy-light smokers was 60 g smaller than in the conventional analysis. In contrast, the effect of light-heavy smokers was greater than in the conventional analysis (259 g reduction). **Quitting smoking during pregnancy:**-The conventional analysis indicated that stopping smoking after the 1st trimester reduces birthweight, although this result depends on the number of cigarettes smoked per day. The birthweight reduction in offspring of light smoking mothers who quit smoking after the 1st trimester was 47 g, whereas the reduction was 79 g for mothers who were heavy smokers. The sibling analysis showed that the reduction was smaller and less pronounced for heavy smokers (29 and 1 g, respectively). **Relapsing smoking during pregnancy:**-The conventional analysis showed reduced birthweight for the offspring of mothers who did not smoke in the 1st trimester but subsequently relapsed during pregnancy. These offspring had a 142 g reduction if their mothers became heavy smokers in the 3rd trimester and a reduction of 129 g if their mothers became light smokers. We found analogous effects in the sibling analyses, but in absolute values, the reduction was substantially less apparent than in the conventional analysis (i.e., 83 g for the category of non smoking-heavy smokers and 77 of non smoking-light smokers).[9] The second study that was also positive for the correlation between maternal smoking and low birth weight was done in Japan. Data were obtained from a questionnaire survey of all mothers of children born between 2004 and 2010 in Okinawa, Japan who underwent medical check-ups at age 3 months. Variables assessed were maternal smoking during pregnancy, maternal age, gestational age, parity, birth year, and complications during pregnancy. Stratified analyses were performed using a logistic regression model. The results in total, 92,641 participants provided complete information on all variables. Over the 7 years studied the last two years which were from 2008-2010 showed the biggest chance of low birth weight which out of 2427 babies born 16.3% percent of them were associated with low birth weight whilst from 2006-2007 there were a total of 2199 babies born with mothers who smoked of those babies 14.5% were associated with low birth weight and in the year 2004-2005 there were 2609 babies born and about 14% were associated with low birth weight.[10] The last study in this report that shows the association between maternal smoking and children's low birth weight was done in Taiwan. The patients were acquired

from the Taiwan Birth Cohort Study. Between June 2005 and July 2006, 21,248 postpartum women were interviewed 6 months after their deliveries by a structured questionnaire. The parents were divided into four groups according to the amount of smoking during preconception, the first trimester, and the second and third trimesters. The relationships of parental smoking with gestational age and birth weight during the different pregnancy stages were assessed. After adjusting for the physical and socioeconomic status of the parents and for paternal smoking during the same period, we found that maternal smoking decreased birth weight with about 11-16%. Compared with the nonsmoking groups, all the maternal smoking groups had higher incidences of LBW, SGA, and preterm birth infants, especially when the mothers smoked >20 cigarettes/day. [11] Now that I've discussed the correlation between low birth weight and maternal smoking I will now talk about two study that shows how second hand smoking can be correlated to cause or have similar effect as first hand smoking, There was a study which combined two different studies that talks about how second hand smoking increasing the chance of lung cancers, this study combined two different studies one done in the united states of America the other was done in Europe more specifically done in Germany and Sweden. The results of this report showed that second hand smoke and lung cancer provides firm evidence for a dose- response relationship between lung cancer risk and duration of exposure to secondhand smoke for the 3 main sources of exposure: spousal, workplace and social. The estimate of the increased risk is 18% (95% CI = 1–37) in those ever exposed to spousal secondhand smoke and is 23% in the long- term exposed. [12] The other study talked about nicotine concentrations in homes were one person of family were smokers from 31 different countries and 40 different households were reported from them. The reported Results. Median air nicotine concentration was 17 times higher in households with smokers ($0.18 \mu\text{g}/\text{m}^3$) compared with households without smokers ($0.01 \mu\text{g}/\text{m}^3$). Air nicotine and hair nicotine concentrations in women and children increased with the number of smokers in the household. The dose–response relationship was steeper among children. Air nicotine concentrations increased an estimated 12.9 times (95% confidence interval=9.4, 17.6) in households allowing smoking inside compared with those prohibiting smoking inside. Conclusions. Our results indicate that women and children living with smokers are at increased risk of premature death and disease from exposure to SHS. Interventions to protect women and children from household SHS need to be strengthened. [13]

Conclusion: -

As this report shows there is a direct correlation between maternal smoking and low birth weight and this was supported by all three studies taken from three different countries, Sweden Taiwan and japan, all these reports conducted showed that there is a decrease of about 13-19% of the babies weight born from mothers whom smoke or smoked cigarettes during the 1st – 3rd trimester of their pregnancy. This report also try to discuss how second hand smoking can affect people just as bad as first hand, and this was done by showing some data from to separate studies. One of the studies showed how secondhand smoking in occupational and spousal environments lead to an increase to risk of lung cancer whilst the other report talked about how nicotine concentrations increased in households whom had one of their members smoking inside the house, and nicotine is one of the carcinogenic agents found in cigarette smoke, these two reports helped in

giving some support to my secondary objective of this report idea in the abstract in which I stated that second hand smoking from Libyan mothers can actually lead to low birth weight children. I tried to get some results here in Libya but I didn't find much compliance from most people.

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