Original Research Article

Prevalence of abortion and neonatal death and its relation to congenital TORCH infections in the departments of gynaecology and obstetrics and neonates of Benghazi Medical Centre from 2014 to2018.

Abstract:

Background:

TORCH infection are responsible for the major of maternal and fetal morbidity and mortality in the pregnancy because of their ability to generate congenital defects. It transmits to foetus from the mother during gestation or delivery time and leads to serious complication to foetus. It can lead to abortion, congenital anomalies and intrauterine fetal death. In fact, the most effective way to prevent the infection is a regular hand washing particularly when caring for infected women and babies. The aim of this study is to assess the relationship between the rate of abortion and foetus death and TORCH infection as a major cause.

Methods: The data was collected from neonatal death records from the department of gynaecology, obstetrics and neonates at Benghazi Medical Centre, which includes age groups, and causes of death, the data included all records from October 2014 to December 2018.

Results: The current study reveals that there is a significant elevation in the fetal and infant mortality rates from 2014 to 2018, and these numbers were increasing throughout the years without any medical reasons. High foetus death was observed at gestational period 33 -40 weeks, while the neonate death was higher at age 1 to 30 days. Furthermore, this study reported that head and brain congenital anomalies was the most common between foetus and neonates and this findings were assumed that the death of the foetus and neonate could be caused by any of TORCH infections when compared to previous studies.

Conclusion: Elevation rates of neonates and foetus is an obvious issue that must be of major concern, so that, the findings of this study emphasizing on the demand for doing TORCH test for all pregnant women at the first of pregnancy to early recognizing the infection. In addition, it is ensuring on the demands of doing TORCH test with the required HIV and hepatitis C tests before delivery to guide the staff take further attention. in addition, it

emphasizes on the need to focus on the effectiveness of hand hygiene, cleaning and disinfection in the department to reduce the rate of infection.

1. Introduction:

Abortion and stillbirth are attributed to several causes such as TORCH infections, endocrine problems, chromosomal abnormalities, environmental hazard, genetic and maternal diseases (Kock, 2004).

TORCH is stands for Toxoplasma gondii, rubella, cytomegalovirus and herpes (Deka, 2011). They are the most common cause of foetus mortality and morbidity in developing country(Das et al., 2007), which the primary TORCH infection has reported high mortality rates than recurrent infection (Maruyama et al., 2007).
It can be transmitted during gestation or delivery time through placenta (Deka, 2011), their symptoms are generally asymptomatic and chronic in mothers (Tiwari et al., 2016), however, it can cause serious impacts in foetus(kaur et al., 1999) such as abortion, congenital anomalies, foetus death, malformation or leads to live baby with diseases(Maruyama et al., 2007). These happen as results of disability of foetus to resist the caused organisms (Mladina et al., 2002) and that leads to negative social and economic impact (Sebastian et al., 2008).

Toxoplasmosis gondii is caused by protozoan, it is the most prevalent one of TORCH infections (Sadik et al., 2012). It can be transmitted through contaminated soil, food and water with oocytes from infected cat faecal and contaminated raw meat with tissue cysts, and tachyzoites can transmit through transplacental during gestation period from mother to foetus (Deka, 2011). Infected mothers are usually asymptomatic, however, it has negative impact on the foetus development depending on the stage of pregnancy (The Center for Food Security and Public Health, 2017), it leads to abortion, still birth or live baby with congenital toxoplasmosis such as small or very large head (CDC, 2018). The incidence of Foetus infection is more common during the third trimester, which is about 60- 70%, while the first trimester is more sever and less common, which about 10-15% (Deka, 2011). Its effects during the first trimester include fetal abnormalities range from chorioretinitis, hydrocephalus, convulsions and intracerebral calcifications to only mild effects, such as slightly diminished vision. Strabismus, nystagmus and microphthalmia. Furthermore, Foetus infected in the third trimester are often asymptomatic at birth and if they do not treat, these neonates may have severe complications such as chorioretinitis, pneumonia, splenomegaly, hepatomegaly, maculpopular rash (The Center for Food Security and Public Health, 2017).

Rubella is RNA virus from paramyxovirus (Sadik et al., 2012); it transmits through the airborne droplet of infected person (WHO, 2019). About 60 % of foetus become infected during the first three months of gestation period, this type of infection leads to elevate frequency of miscarriage, still births as well as congenital malformations called Congenital Rubella Syndrome CRS.(Hamdan et al., 2011) and its symptoms include UTI, fever, conjunctivitis, malaise and lymphadenopathy. In addition, it leads to loss of hearing, blindness, mental retardation (Kesson, 2001) and congenital heart defect. The defects in cardiac and eyes are developed when the infection is getting during the first 8 weeks, while hearing defects and retinopathy are happening when infection getting during 16 weeks (Deka, 2011).Also, it causes Low birth weight and Skin rash at birth (CDC, 2017).

Herpes Simplex Virus (HSV) infection is transmitted to foetus through birth canal of infected mothers during birth, so that this infection usually acquired at birth (Sadik et al., 2012). Moreover postnatal infection occurs through kissing or touching neonate by infected person and mother can get infection from direct contact with infected lesion, its complication on infant include lesion of skin such as ulcer and erythematous; neurological lesion such as encephalomalacia, haemorrhage, ventriculomegaly and calcification; and lesion of eyes such as chorioretinitis, cataracts and detachment of retinal (Wilson, 2013).

Cytomegaloviruse (CMV) is herpesvirus; it occurs more common during perinatal periods (Padmavathy et al., 2013). It can be transmitted at any stage during pregnancy, its rout of transmission to foetus include trans placental transmission, infected breast milk and other body fluids like saliva and urine (Pizzo, 2011).The most common infection transmission happens in the first trimester; about 90% of primary CMV infection is asymptomatic (Deka, 2011). Its sign on infected neonate include baby with congenital CMV seems healthy at birth but the develop sign over the time with signs such as hearing loss, developmental delay, low birth weight, yellow skin and eyes, enlarged an poor liver and spleen function, purple skin splotches or rashes or both, abnormal small head (microcephaly), enlarged spleen, retinitis. (CDC, 2018)

The aim of this study was to assess the relationship between the abortion and neonate death and the TORCH infection in the department of gynaecology and obstetrics of Benghazi Medical Centre.

2. Methods and material

2.1 Study design: This study was descriptive cross sectional design.

2.2 Method of data collection: The data was collected from neonatal death records from the department of gynaecology and obstetrics of Benghazi Medical Centre, which includes age groups, and causes of death, that obtained from all death certificates from October 2014 to December 2018.

2.3 Target population and sample size: It includes all records of abortion and neonatal death and sample size was 2169 death certificate recorded from October 2014 to December 2018.

2.4 Statistical analysis: The Statistical package for social sciences (SPSS) version 22 software was used to analyse the collected data.

Limitations: Most certificates did not include reliable and accurate data about the foetus and preterm ages and the main causes of neonatal death and abortion.

3. Results:

Table 3.1 shows that the rates of fetal and neonate death has been increased gradually in the period 2015–2018, which increased from 357 to 586 death cases .

Table 3.1: Number of fetal and neonate death cases from 2014-2018

Years	Number of death cases (age in weeks)	Number of death cases (age in days)	Total Number of death cases
2014	34	65	145
2015	169	188	357
2016	353	202	555
2017	285	244	529
2018	306	277	583

Additionally, table 3.2indicates that the mortality rate of foetus is higher among age group 33 to 40 weeks than other groups. However, the mortality rate of neonate is higher among age group 1day to one month. (See table 3.3)

Table 3.2: Number of fetal death cases according to age from 2014-2018

Age (in weeks) before born	Number of death cases 2014	Number of death cases 2015	Number of death cases 2016	Number of death cases 2017	Number of death cases 2018
1-8	0	1	4	1	1
9- 16	3	11	4	3	2
17-24	14	60	90	54	53
25 -32	9	47	114	106	116
33-40	7	50	139	117	129
44-41	1	0	2	4	5
Total	34	169	353	285	306

Table 3.3: Number of neonate death cases according to age from 2014-2018

Age (in days) after born	Number of death cases 2014	Number of death cases 2015	Number of death cases 2016	Number of death cases 2017	Number of death cases 2018
1-23 hour	40	14	40	49	52
1-30	38	37	100	156	165
31-60	1	0	3	2	1
90-120	1	0	0	1	0
Unknown Age	6	137	59	36	59
Total	65	188	202	244	277

Table 3.4: Number of fetal and neonate death cases according to causes of death from 2014-2018

Regarding the causes of death, table 3.4demonstrates that congenital malformation anomalies is the main cause of death in 2017, while Intrauterine fetal death is the main mentioned cause in death records in 2014, 2015, 2016 and 2018.

In more detail, figure 3.1 represents that most common type of congenital anomalies is Congenital deformities in the lungs in 2016, 2017 and 2018, while the Multiple congenital malformations is the common reported cause in death certificates of cases in 2014 and 2015, also, it comes the second one after lungs deformities in 2016 till 2018.

Causes of death	Number of death cases in 2014	Number of death cases in 2015	Number of death cases in 2016	Number of death cases in 2017	Number of death cases in 2018
Abortion	7	67	24	16	34
Intrauterine fetal death	59	136	212	171	202
preterm births	20	55	15	19	34
congenital malformation anomalies	38	87	151	197	188
Sepsis	4	12	35	26	35
Cardiopulmonary arrest	13	11	45	39	22
Prune Belly syndrome	0	0	0	1	0
Edward syndrome	0	1	5	5	8
Down's syndrome	0	0	0	2	3
Patau Syndrome	0	0	0	0	1
Potters syndrome	0	0	0	0	1
Causes related to mother health status	2	14	40	53	44
Unknown reason	2	23	28	3	5

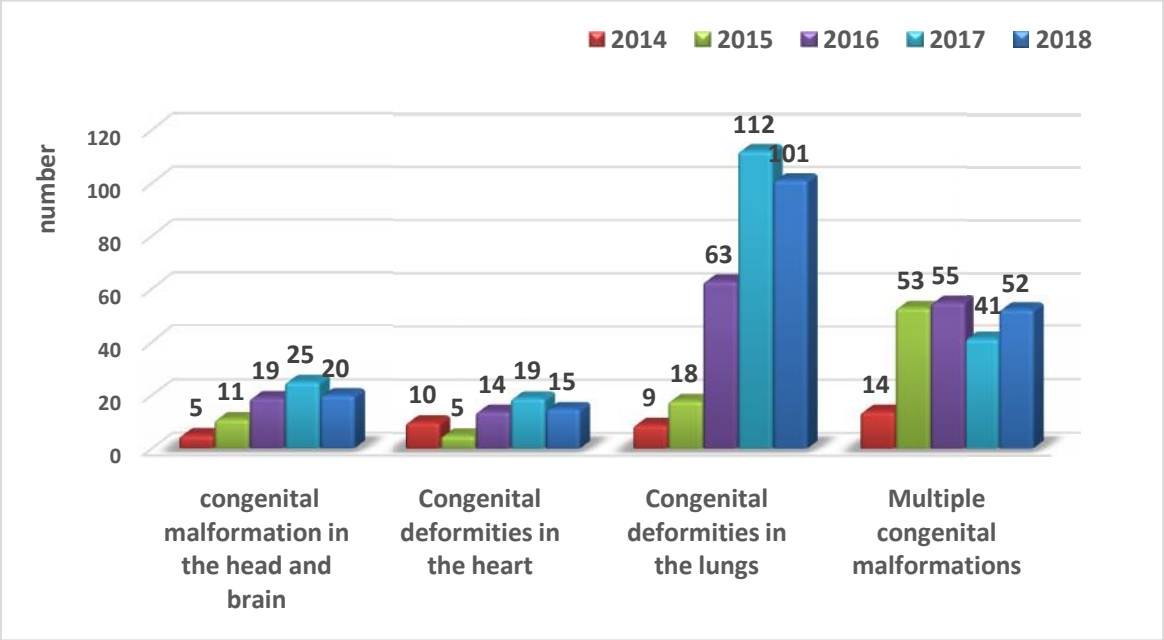

Figure 3.1: types of congenital anomalies

Table 3.5: Number of fetal and neonate death cases according to death causes related to mothers health status from 2014-2018

Causes of death	Number of death cases in 2014	Number of death cases in 2015	Number of death cases in 2016	Number of death cases in 2017	Number of death cases in 2018
Hypo or hyperglycaemia	1	5	3	3	1
Hypertension	0	0	0	5	9
placental abruption	0	0	20	18	21
sever birth asphyxia	1	6	6	16	13
placenta around the neck	0	0	4	4	3
Shortage in amniotic fluid	0	0	2	2	3
Hypertension Leaded to placental abruption	0	9	4	3	2
Uterine Rupture	0	0	0	2	1
Ectopic pregnancy	0	0	0	0	1
G4 P3	0	0	1	0	0

Total	2	14	40	53	44

3. Discussion:

The findings of the current study reveals that there is an obvious issue that must be of major concern because it found a significant elevation in the fetal and infant mortality rates from 2014 to 2018. In addition, it found that the highest rate of the intrauterine death was reported at the age groups 33-40 weeks, followed by age groups 25-32, 17-24, then 1-16 weeks. In contrast, Song et al. found that the highest rates of foetus death was observed at 20-23 weeks in Japan, Korea and United States from 2009 to 2014. It could say the highest number of foetus death during 33- 40 weeks of gestation period in this study may belongs to Toxoplasmosis, syphilis and cytomegalovirus infection. Which the highest rate of toxoplasmosis infection transmission can be seen in the third trimester and it is accounted for 60- 70% (Deka, 2011). Furthermore, transmission of congenital syphilis and cytomegalovirus can occur at any stage of the pregnancy (WHO, 2017), additionally, Zeb et al. (2018) indicated that high foetus rate was reported at 21-25 weeks and 31- 35 weeks, and 6.9% of these cases was related to TORCH infection with high rate reorted to Toxoplasmosis infection (Zeb, 2018).

On the other hand, Sebastian et al. found that high foetus death rate was at first trimester in 2008 in Kerala and they found that 50.7% of these cases had toxoplasma, 11.9% rubella, 28.2% CMV and 59.2% for HSV. The results from other studies presented that fetal loss during the first few weeks of pregnancy has been estimated to be 31% after implantations, the earliest recognizable effects of infection are usually clear after six to eight weeks of pregnancy (WHO, 2012).

Whereas, the neonatal death rate were recorded after delivery 1-30 days, and that could probably caused by HSV, this is due to the fact that says, the highest risk of passing herpes to new-born occurs during the third trimester at the time of delivery.

Additionally, intrauterine foetus death was reported as the main cause of death in 2014, 2015, 2016 and 2018 in this study which could be caused by CMV, Rubella and Toxoplasmosis infection, this was agrees with prasoona et al. 2015 which found that 96 % of intrauterine death was caused by CMV infection. Also, study found that Intrauterine death cause was followed by congenital malformation, abortion, cardio-pulmonary arrest and sepsis, and all

these causes was significantly associated with TORCH infection, which Prasoona et al. carried out study that in reality emphasize the connection between intrauterine, neonatal death and etiological agents (TORCH) that causing abortion, intrauterine death and congenital anomalies. This study included 1158 high-risk pregnant attending to Modern Government Maternity Hospital from 2010 to 2013 in India. They found that 97% of pregnant had IgM and IgG seropositivity for CMV, 84% for Rubella, and 65% and 36% for HSV and toxoplasmosis respectively. In more details, they found that 55% of infected women with toxoplasma had preterm labor, 45% intrauterine death, 32% repeated abortion, also, Rubella seropositivily showed congenital anomalies, preterm labor, neonate death, repeated miscarriage an death, 95% preterm labor, 94% early infant death and 92% congenital anomalies. Lastly d intrauterine death. Furthermore, pregnant infected with CMV showed 96% intrauterine, Seropositivity pregnant for HSV indicated 77% congenital malformation, 72% preterm labor, 70% repeated miscarriage.

Furthermore, the findings of the current study showed the congenital malformations recorded as the most common cause of death in 2017. This also was demonstrated in the WHO report in 2016 that suggested the main cause of neonatal and fetal death is congenital anomalies and it considered the maternal infection with TORCH as one of the main risk factors of fetal and neonatal deaths that result of maternal infection with syphilis and rubella. Since syphilis it has estimated to be about 1.5 million cases that occur during pregnancy each year (Newman et al., 2013). Moreover, about 60 % of foetus become infected with rubella during the first three months of gestation period and causes serious consequences on the foetus. It can affect the development of the foetus organs, which result in miscarriage, fetal death, and congenital anomalies (Hamdan et al., 2011). Furthermore, Cardiopulmonary failure could be happen as result of paravirus B 19 infection which paravirus induce arrest of production of red blood cells primarily in the second trimester period (miller et al., 1998). In addition, this virus could lead to increase the risk of abortion and stillbirth (xiong et al., 2019).

Moreover, the present study indicated that 80 cases out of 661 had congenital head and brain, and that could be as result of TORCH infection which Xinet al., 1997 studied the relationship between TORCH infection and the neurological change in neonate and infant by using CT scan. They found TORCH is associated positively with head and brain malformation, which it leads to micro cephalic focal, hydrocephalus and calcification. In addition, they found the earlier infection of pregnancy was relate to brain developmental anomalies. Furthermore,

Malinger et al. 2003found that microcephaly and abnormal brain CT scan were reported in all infected foetus with CMV of mean age 27.5 weeks. Additionally, Sunitha et al. 2016 reported that central nervous system such as microcephaly and intra cardiac focus was the major congenital anomalies, followed by renal anomalies, this study included 3301pregnant and diagnosis was done by TORCH test and 3D and 4D ultrasound, also, they reported that toxoplasmosis have a significant association with in pregnant with congenital anomalies in South India.

5. Conclusion:

It is not surprising to say that in this study the clinicians working in the department of gynecology, obstetrics and neonates had poor knowledge about TORCH infections. Consequently, it was written in the vast majority of the death certificates for both neonates and foetus the main cause of fatality is intrauterine foetal death. Honestly, it is not scientific or logic to say that there are no reasons for intrauterine foetus death. Especially, when it is found in the sero-epidemiological studies number of foetal death similar to the recorded cases in this paper. More importantly, the WHO, 2016 stated that perinatal deaths are poorly recorded and are therefore presumably not to be accounted for .Actually, there are many evidences that prove the TORCH infections can cause mild maternal morbidity but have serious fetal consequences.

To conclude, It is important to take in account that the knowledge of these infections will help the clinician in counseling mothers on the appropriate preventive measures to avoid TORCH infection, also will help the parents on detection of the potential of adverse fetal effects when these infections are present.

6. Recommendation:

1. The findings of this study emphasizing on the demand for doing TORCH test for all pregnant women at the first of pregnancy to early recognizing of the infection. In addition, it is ensuring on the demands of doing TORCH test with the required HIV and hepatitis C tests before delivery to guide the staff take further attention.
2. Screening for TORCH infections in all women (married and pregnant) especially those with a history of frequent abortion ,neonatal and foetal death.
3. As a result of TORCH ways of transmission mainly through blood, and other bodily fluids the need to focus on the effectiveness of hand hygiene, cleaning and disinfection in the department to reduce the rate of infection must be in much concern.

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