



doi: <https://doi.org/10.20546/ijcrar.2018.611.003>

A Retrospective Study of Seasonal Influenza (H1N1 – Swine Flu) in Antenatal and Postnatal Mothers in a Tertiary Care Centre in Gujarat, Ahmedabad, India

Sushma Shah and Sharon Sam*

Department of Obstetrics and Gynecology, Smt. N.H.L Municipal Medical College, Ahmedabad, Gujarat, India -380016

*Corresponding author

Abstract

Seasonal influenza is among the most frightening and potentially cataclysmic threats to pregnant and postnatal women. They are a vulnerable population owing to the multiple physiologic changes that occur during pregnancy. A hospital based retrospective observational study was done. Statistical data was obtained from prior Swine flu records for the period of 2017 to 2018 and analysed. It was observed that, there were 97 women in the reproductive age group (15-49 years) who were suspected of seasonal influenza (H1N1) and of these women, 37 women were confirmed seasonal influenza H1N1 positive by RT-PCR technique. 9 women in this study group were pregnant and their cases were studied. We observed pregnant women constituted 1/4th of women of reproductive age group of which 50% were young primigravida who succumbed to the infection. The likelihood of flu related morbidity and mortality were high especially during the second and third trimesters of pregnancy. There was 44% fetal demise in H1N1 positive mothers. Thus we concluded that antenatal and postnatal mothers are a very high risk, vulnerable population for seasonal influenza. In pregnancy, it is associated with increased fetomaternal morbidity and mortality. Primary prevention, early prophylaxis and adequate treatment with antivirals, vaccine use and health care planning are mandatory to manage cases of seasonal influenza (Swine Flu H1N1) in pregnant mothers.

Article Info

Accepted: 18 October 2018

Available Online: 20 November 2018

Keywords

Season influenza, H1N1 epidemic, Antenatal and post natal mothers, Trimester, Pregnant, Primigravida, Vaccination, Maternal mortality.

Introduction

While declaring the Pandemic to be over in August 2010, World Health Organization conveyed that Pandemic Influenza A (H1N1) virus that caused Pandemic [2009-2010], would circulate as Seasonal Influenza virus and would continue to do so for years to come (WHO, 2010). Pregnant women especially those with co-morbid conditions are at higher risk of developing influenza-related debilitating complications and death as described by Neuzil *et al.*, (1998) and Dodds *et al.*, (2007). This may be attributed to the multiple physiologic changes that occur during pregnancy, including alterations in the cardiovascular, respiratory and immune systems

(Jamieson *et al.*, 2006). As per the revised data of the MOHFW (NCDC) Seasonal Influenza guidelines, the statistics are staggering. The cases were reported throughout the year with bimodal peaks in rainy season (July August), and in winter spring season (December-February) according to the observations by Manoj *et al.*, (2016). In 2017, in Gujarat state alone there were 7709 seasonal influenza (H1N1) cases of which 431 resulted in mortality. And in 2018 (as on 14-10-2018) there were 1478 reported cases of seasonal influenza with 45 mortalities (NCDC, 2018). These statistics show that seasonal influenza in India is emerging as among the most panic causing and life threatening infections.

Materials and Methods

This retrospective observational study was done by analyzing and studying the records of those suspected with influenza attending the Swine Flu Clinic of Smt. N.H.L MMC, Ahmedabad, for the period of 1st March 2017 to 1st March 2018 (1 year).

All data was accessed and studied from the Swine flu records with the required permissions and it was observed that 97 women of reproductive age group (15 to 49 years – WHO, 2006) were suspected with the seasonal influenza (Swine flu H1N1 virus), of which 37 were diagnosed positive including 9 peripartum women. The cases of all antepartum and postpartum patients were studied irrespective of age, gravida and gestational age.

As per the standard operating protocol for indoor patients during the hospital stay of the patient, clinical specimen of two simultaneous throat swab or nasopharyngeal swabs and confirmation by RT-PCR was done for diagnosis of seasonal influenza (Swine Influenza H1N1) at approved state government laboratories i.e. B.J. Medical College, Ahmedabad and NHL Medical College, Ahmedabad, Gujarat (MOHFW, 2017). These reports were accessed from the NHL Medical College Central Laboratory Influenza Register.

The study population was classified according to WHO and Ministry of Health & Family Welfare (India) guidelines of risk categorisation of Seasonal Influenza cases (revised on 18.10.2016).As per the above classification, the present study population belonged to B (ii) category.

Inclusion criteria

- All women of reproductive age group (15 to 49 years - WHO) who were pregnant, or postnatal and

confirmed H1N1 (swine flu) positive (irrespective of age, gravida and gestational age).

Exclusion criteria

All those **not** confirmed with diagnosis of seasonal influenza (H1N1) and those women not pregnant or not falling in the reproductive age group.

Results and Discussions

Figure 1 shows that 24.3 % of women of reproductive age group, diagnosed as H1N1 positive, were pregnant women. This means that one-fourth of the affected population were pregnant women which is alarming and calls for urgent attention.

According to Figure 2, cases in the current study showed a bimodal distribution of cases spread through the year with peak in March-April and July-October.

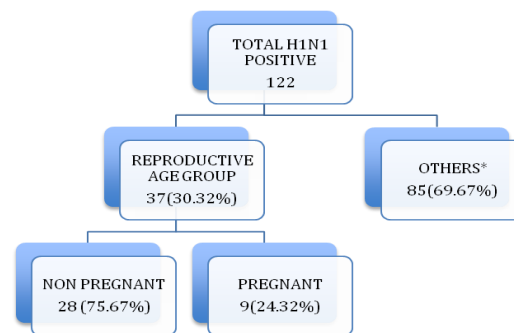
Table 1 showed that 66.66% i.e. 2/3rd of the mothers were primigravida and young (<30 yrs age) and 50% of these young lives were lost to influenza infection.

In the present study an equal percentage of 44% of H1N1 positive mothers were in either 3rd trimester or post partum period. All mothers (100%) who contracted seasonal influenza (H1N1) in the third trimester succumbed to the infection (Table 2).

55.55% of pregnant patients who were H1N1 positive succumbed to the infection. There was 60% fetal morbidity and 44.44% fetal mortality (Table 3).

All pregnant women with confirmed seasonal influenza (H1N1) who presented with low sPO2 on admission were at greater risk of development of pneumonia and subsequently Acute Respiratory Distress Syndrome requiring mechanical ventilation (Table 4).

Fig.1 Details of the study population



*Others include men and women NOT of reproductive age group

Fig.2 Seasonal distribution of seasonal influenza (h1n1 swine flu)

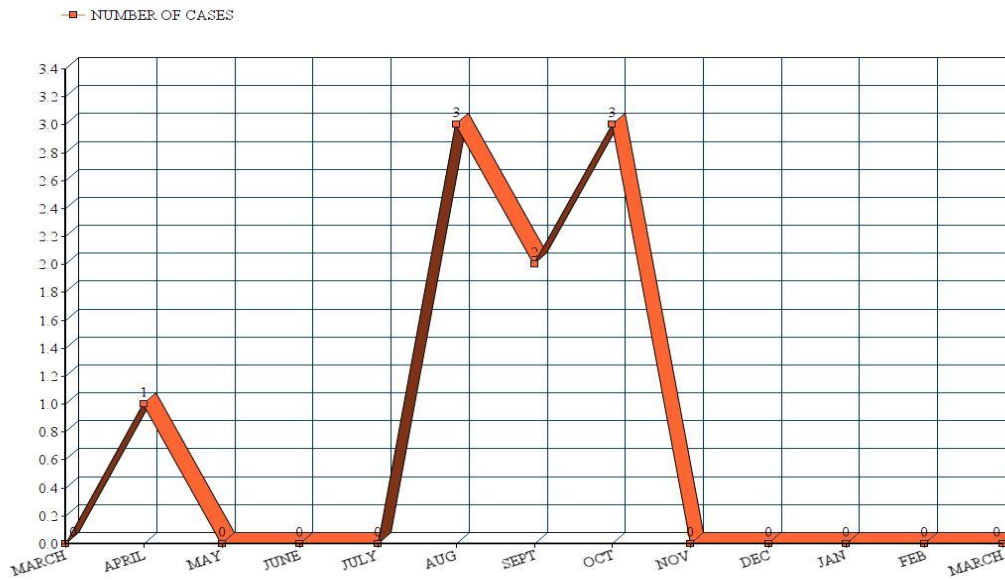


Table.1 Parity of h1n1 positive mothers and maternal outcome

Parity	Age (<30 yrs)	Live	Expired
Primi	6 (66.66%)	3 (50%)	3 (50%)
Multigravida	2 (22.22%)*	1 (33.33%)	2 (66.66%)
Total	8	4	5

* 3 Multigravida of which 1 above 30 years

Table.2 Gestational age and maternal outcome in h1n1 positive mothers

Term of gestation	No. of patients	Live	Expired
1 st trimester (<16)	0 (0%)	0	0
2 nd trimester	1 (11.11%)	1	0
3 rd trimester	4 (44.44%)	0	4 (100%)
post partum	4 (44.44%)	3	1 (25%)

Table.3 Maternal and foetal outcome in h1n1 positive mothers

	Live		Expired		
MATERNAL OUTCOME	4 (44.44%)		5 (55.55%)		
	5 (55.55%)		4 (44.44%)		
Foetal outcome	Discharged	NICU	IUD	SB	MAT MORT
	3	2	2	1	1

*Expired in utero with maternal mortality

Table.4 SpO₂ and mechanical ventilation on admission

Present study	sPo ₂ <90	Mechanical ventilation	Maternal outcome		ARDS	B/L Pneumonia	Septicemia	multiple causes
	6		6	Live				
			Expired	5 (83.3%)	3	1	1	(3)*
Jameison et al., 2009		6	Expired	6 (100%)	6	6		

* Expired due to multiple causes including ards, pneumonia

- 24.3 % i.e., 1/4th of the study group diagnosed as H1N1 positive were pregnant women, which is alarming and calls for urgent attention.
- Majority (77.7 %) of the H1N1 positive women were from urban areas which is an epidemiological factor as described in epidemiology studies of MOHFW, India which states that urban and peri-urban areas are prone to overcrowding and thus vulnerable to such airborne life threatening diseases.
- Seasonal influenza (H1N1) as the name itself indicates, has a seasonal i.e., bimodal distribution over the year with epidemics occurring in rainy season and winter (Manoj et al., 2016). This helps us anticipate and be prepared for each influenza season with vaccination, medication and equipment e.g. N95 masks and viral investigation kits.
- 66.66% i.e. two-third of the mothers were young primigravida (<30 years age). 50% of these mothers succumbed to the seasonal influenza (maternal mortality). This indicates that primigravida young women are a vulnerable population which needs to be protected with effective strategy (US HHS, 2017) like:

Early suspicion, immediate investigation and liberal chemoprophylaxis and therapy; and Stringent preventive measures for protection of mothers like reduced exposure to possible H1N1 cases and increased hygiene measures like use of masks during seasonal epidemic periods is recommended.

- Table 3 confirms the prediction of Robert J. Pratt, 2010 who states that there is enhanced likelihood of increased influenza related morbidity and mortality especially during the second and third trimesters of pregnancy. All mothers (100%) who contracted seasonal influenza (H1N1) in the third trimester

succumbed to the infection (Rasmussen *et al.*, 2012). Postpartum patients were at equally high risk as antepartum patients which confirms the CDC, September 2017 guidelines.

- 55.55% of pregnant patients who were H1N1 positive ended in maternal mortality.
- Only 33.3% of babies were stable and discharged whereas there was 60 % fetal morbidity and 44 % fetal loss in mothers who were H1N1 positive (Table 4). USG changes showed oligohydramnios (55.55%) and intra uterine deaths (11.11%).

In a recent study, the capacity for human vertical transmission through placenta of highly pathogenic strains of influenza was demonstrated (Shu *et al.*, 2006). A meta-analysis found that the presence of maternal fever during labor has been shown to be a risk factor for adverse neonatal and developmental outcomes, including neonatal seizures, encephalopathy, cerebral palsy, and neonatal death (GuJ *et al.*, 2007).

- Of the H1N1 positive pregnant mothers in this study, 83% went into spontaneous labour and progressed to normal vaginal delivery. All these mothers delivered with fetal maturity above 34 weeks.
- Pregnant women seem to be at a greater risk than non-pregnant women with influenza for increased rate of hospitalization following the development of pneumonia and subsequent acute respiratory distress syndrome requiring mechanical ventilation which eventually progressed to death (Jameison *et al.*, 2009).
- Vaccination of pregnant women not only benefits the woman herself but also indirectly gives immunity to her infant, which can last the first 6 months of life when vaccination is not approved for children.

Swine flu shot i.e., IIV (Inactivated Influenza Vaccination) can be given safely to all pregnant mothers. ICMR recommend quadrivalent seasonal influenza vaccination for the year 2018 in India.

CDC, 2017 guidelines suggest that post partum women can receive nasal spray vaccine i.e., LAIV (Live attenuated Influenza Vaccine) or IIV.

Primary prevention by appropriate hygiene measures; prior preparedness, prophylaxis and treatment with antiviral and other medications, vaccine use and non-pharmaceutical interventions and health care planning are of utmost requirement to manage cases of pregnant seasonal influenza (Swine Flu H1N1) mothers.

References

- American College of Obstetricians and Gynecologist. Committee opinion: influenza vaccination during pregnancy. Washington, DC: ACOG 2010.
- CDC September 2017 guidelines on seasonal Influenza and Vaccination
- Department of Health and Human Services. HHS Pandemic Influenza plan. Supplement Healthcare planning. Available at <https://www.cdc.gov/flu/pandemic-resources/pdf/pan-flu-report-2017v2.pdf>
- Directorate of Health Services, Kerala H1N1 Influenza (adapted from the GoI- MoHFW guidelines, and updated 2017 Feb).
- Dodds, L., McNeil, S., Fell, D.B., *et al.*, 2007. Impact of influenza on rates of hospital admissions and physician visits because of respiratory illness among pregnant women. *Canadian Medical Association Journal* 176, 463–468
- GuJ,XieZ,GaoZ,etal.H5N1 infection of the respiratory tract and beyond: a molecular pathology study. *Lancet*. 2007;370:1137–1145.
- Jamieson, D.J., Honein, M.A., Rasmussen, S., *et al.*, 2009. H1N1 2009 influenza virus infection during pregnancy in the USA. *The Lancet* 374, 451–458.
- Jamieson, D.J., Theiler, R.N., Rasmussen, S.A., 2006. Emerging infections and pregnancy. *Emerging Infectious Diseases* 12, 1638–1643
- Manoj Murhekar *et al.*, *Indian J Med Res*. 2016 Jun; 143(6): 821–823. The 2015 influenza A(H1N1) pdm09 outbreak in India.
- Ministry of Health and Family Welfare Directorate General of Health Services (National Centre for Disease Control) Seasonal Influenza guidelines for vaccination with Influenza Vaccine -Updated on 28th May, 2018)
- Ministry of Health and Family Welfare, Government of India. Guidelines on categorization of Influenza A H1N1 cases during screening for home isolation, testing treatment, and hospitalization (Revised on 18.10.2016).
- Neuzil, K.M., Reed, G.W., Mitchel, E.F., Simonsen, L., Griffin, M.R., 1998. Impact of influenza on acute cardiopulmonary hospitalization in pregnant women. *American Journal of Epidemiology* 148, 1094–1102.
- Rasmussen SA, Jamieson DJ, Uyeki TM. Effects of influenza on pregnant women and infants. *Am J Obstet. Gynecol.*, 2012; 207 (3 suppl) ; S3-8.
- Robert J. Pratt, Pandemic A (H1N1) 2009 influenza—an enhanced hazard during pregnancy, *Elsevier Journal of midwifery* (2010) 26, 13–17
- Seasonal Influenza (H1N1)– State/UT- wise, Year- wise number of cases and death from 2011 to 2018 (till 14thOctober , 2018), Integrated Disease Surveillance Programme, National Centre for Disease Control, India.
- Shu Y, Yu H, Li D. Lethal avian influenza A(H5N1) infection in a pregnant woman in Anhui Province, China. *N Engl J Med*. 2006;354:1421–1422.
- WHO 2006 definition of reproductive age group - Reproductive health indicators guidelines.
- WHO, August 2010. H1N1 in post-pandemic period. WHO Press Conference.

How to cite this article:

Sushma Shah and Sharon Sam. 2018. A Retrospective Study of Seasonal Influenza (H1N1 – Swine Flu) in Antenatal and Postnatal Mothers in a Tertiary Care Centre in Gujarat, Ahmedabad, India. *Int.J.Curr.Res.Aca.Rev.* 6(11), 18-22. doi: <https://doi.org/10.20546/ijcrar.2018.611.003>