STILLBIRTH;
FREQUENCY AND CORRELATES IN SEVERE ACUTE MATERNALMORBIDITY (SAMM) & MATERNAL DEATH AT TERTIARY HEALTH CARE CENTRE

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ABSTRACT….. Pakistan stands second in the world s rating of highest stillbirth rate. This gives an emergency call to authorities involved in maternity health care of Pakistan to take serious and quick steps to address the problem. **Method:** Retrospective observational study at tertiary health care centre to see frequency and risk factors for stillbirth in cases of severe acute maternal morbidity (SAMM) and maternal death over period from January 2008 till Jan 2010. **Result:** High stillbirth rate 438 | 1000 was found in the study group as compared to still birth rate of 74 |1000 in rest of the deliveries during the same period. Data analysis by using multivariate regression for variables after adjusting for co variable showed significant association (p value < .05) with still births of following factors grand multipara (adjusted OR 1.887 CI 1.156-3.081) primigravida (adjusted OR 1.623 CI -1.023-2.573) low education (adjusted OR 19.378 CI- 2.586-145.208) lack of standard antenatal{care Non booked (adjusted OR 10.101 CI 3.847-26. 518) referred cases (OR 5.879 CI 2.166-15.954)}preterm deliveries (adjusted OR 2.994 CI 1.512-5.931) and vaginal deliveries 1.986 (CI 1.351-2.920) whereas uterine rupture (adjusted OR 4.003 CI 1.647-9.729) prepartum haemorrhage (adjusted OR 3.617 CI 1.756-7.451) and hypertension (adjusted OR 3.298 CI 2.040-5.330)were significant obstetric risk factors. **Conclusion:** Audit of SAMM and maternal death with emphasis on risk factors of still birth would help to find strategies to reduce preventable causes of stillbirth .This would be important relatively quick contribution to efforts of achieving MDG 4.

Key words: Stillbirth, SAMM, Pakistan.

INTRODUCTION

Stillbirth is a major global health problem[1]. Every year about 3.2 million babies are stillborn[2] with 97% occurring in developing countries[3]. Pakistan has second highest stillbirth rate in the world. It has lag behind other countries in the region in rate of reduction of perinatal mortality because of dysfunctional health system, law & order situation, natural disaster like earth quake and flood Pakistan is a signatory to the Millennium declaration. It is expected to reduce its under-five mortality by two-thirds in 2015 (Millennium Development Goal 4[4]. Being country with stillbirth rate > 5 per 1000 births, the goal by 2020 would be to reduce its rate by at least 50% from the 2008 rates[5]. Because of the contribution of perinatal mortality (stillbirth + early neonatal death) to child mortality, unless effective interventions are implemented to reduce perinatal mortality, achieving the MDG 4 will be impossible[6]. Efforts to reduce still birth rate are limited world wide as most of the deaths are not reported, In addition other factors like lack of systemic analysis of

causes and risk factors of stillbirth and complex system of classification designed for developed countries only are also affecting development of strategies to reduce stillbirth. In developed countries stillbirths still account for 1% of all birth. This figure should alert policy maker to take necessary action for reduction of stillbirth[7].

Audit of stillbirth on regular basis particularly in cases of severe acute maternal morbidity Can help to understand correlates and determinants of stillbirth so that effective Interventional programs can be made and implement to address this problem[8] analysis of cases of severe acute maternal morbidity along with maternal death contribute more in evaluating deficiency in maternity health care system[9] & with ultimate goal of reducing maternal morbidity & mortality. Near miss perinatal death & perinatal death occur more in association with near miss maternal death[10] & maternal death due to obstetric risk factors[10,11-13]. Biodun N. Olagbuji et al[14] observed

correlates of stillbirth in SAMM in an attempt to form strategies to reduce stillbirth rate. Such audit can help to form more focused strategies to achieve Millennium Development Goal 4. A study from Bangladesh showed that Interventions to reduce pregnancy outcome like stillbirth by strengthening antennal care could reduce maternal mortality in Bangladesh and similar countries[15]. As in our previous study[9] we found that risk factors of SAMM & maternal death are mostly similar we included both groups in present pregnancy to find frequency & correlates of stillbirth. As strategies formed after conducting such audits would be helpful to achieve both MDG 4 as well as MDG 5.

METHOD

A retrospective observational study was conducted in gynecology unit 1 civil hospital Karachi from 1st January 2008 till 31 December 2009 with objective to determine frequency and correlates of still birth in severe acute maternal morbidity. The annual delivery rate is 2471 and hospital is catering the need of not only Karachi city but other areas of Sindh and Balochistan. Pregnant women attended in the hospital belong to lower or lower middle socioeconomic class.

Inclusion criteria were
1. Women who had SAMM at or after 28 weeks of gestation admitted in emergency with obstetric risk factors like severe hemorrhage Severe hypertension, dystocia, infection and anemia.
2. Maternal death due to obstetric risk factors during the study period.

Exclusion criteria include
3. SAMM & Maternal death at gestational age less than 28 weeks and.
4. SAMM & Maternal death due to medical disorders.

A stillbirth was a newborn of at least 1,000 g of birth weight or corresponding to approximately 28 weeks of gestation or more, with no signs of life at birth, i.e. no breathing, no heart rate, and no movement. Severe

acute maternal morbidity (SAMM), also known as "near miss", is defined as "A very ill pregnant or recently delivered woman who would have died had it not been that luck and good care was on her side"[13,16] Maternal death was the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Obstetric risk factors included severe hemorrhage requiring > 4 unit of blood, cesarean section, hysterectomy or death severe hypertension included cases of imminent eclampsia or eclampsia and severe gestational hypertension or severe preeclampsia. Dystocia included obstructed labor impending rupture and uterine rupture. Hemorrhage included cases of prepartum haemorrhage like placental abruption and placenta previa and post partum hemorrhage. Nonbooked cases who had not received antenatal care during pregnancy. Referred cases were coming from public or private hospitals involved in maternity care. All patients with SAMM were seen by senior registrar on call and managed according to beforehand protocol for severe acute obstetric emergency. Anaesthetist, paediatrician and physician are available round the clock. ICU & nursery and blood bank facilities are utilised whenever needed. Mode of delivery in cases of SAMM is decided after consultation with senior obstetrician on call. During labour fetal monitoring is done by intermittent auscultation and cardiotoco-graphy Proforma was completed for each case using data from hospital records. Factors like demographic maternal characteristic, mode of delivery, maternal outcome and fetal outcome were noted Data were analyzed using the SPSS software.

RESULT
During the study period total number of deliveries was 5109. Still births were 376 stillbirth rate being 74 | 1000 deliveries. Study group included 450 cases

which fitted the inclusion criteria. Of these 422 (93.7%) cases were of SAMM and 28(6.2%) cases were of maternal death. One hundred seventy nine (%) stillbirth occurred in SAMM and eighteen (%) in maternal death group. Still births in the study group were 197 with stillbirth rate 438 | 1000. Neonatal deaths were 31 and alive babies were 222.

Table-I shows that one hundred and forty three (39.6%) still birth occurred in the maternal age group between 21 & 35 years , 31(56.36%) in age group < 20 years and 23 (67.64%) in age group > 35years .Fifty three stillbirths (47.32%) were noted in primigravidae and 87 (37.17%) & 56 (54.36%) still births were found in the parity group 1-4 and > 5 respectively. Unbooked cases had 140(52,43%) where as referred cases had 52 (39.09%) stillbirths. One hundred and seventy stillbirths occurred at gestational age more than or equal to thirty seven completed weeks and 27 at gestational age between 28-36weeks 6 days. Three hundred seventy seven (83.77%) cases of the study were resident of Karachi and had 160 stillbirth, 73(16.22%) cases came from outside Karachi and had 37 still birth using multivariate regression for analysis of variables after adjusting for co variable showed significant association (p value < .05) of grand multipara primigravida low education status lack of antenatal care and vaginal deliveries with stillbirth.

Table-II showed obstetric risk factors and cause specific stillbirth. Frequency of Hemorrhage in the study group was 41.3% and it accounts for 70 cases of stillbirth's. Cause specific still birth rate being 376|1000. Thirty nine out of 50 (78%) cases of prepartum hemorrhage ended in still birth. Hypertension was found to be risk factor in 21.3% cases of study group caused 61(635|1000) stillbirths. Dystocia was found in 37%cases and accounts for 385|1000 stillbirth rate. Obstructed labour and uterine rupture occurred with frequency of 21% & 6.2% and accounts for 421|1000 & 750|1000

Characteristics	n	%
Age (Years)		
<20	55	12.2
21-35	361	80.2
>35	34	7.6
Residence of Patient		
Karachi	377	83.8
Interior Sindh	38	8.4
Balochistan	35	7.8
Gestational Age		
28-36 weeks 6 days	41	9.1
>37 weeks	409	90.9
Parity		
0	113	25.1
1-4	234	52.0
>or=5	103	22.9
Booking status		
Booked	50	11.1
Un booked	267	59.3
Referred	133	29.6
Education		
None / primary	425	94.4
Secondary	25	5.6
Mode of delivery		
Spontaneous virginal	201	44.7
Cesarean section	242	53.8
Instrumental vaginal delivery	7	1.6
Fetal outcome		
Alive	223	49.6
IUD	197	43.8
NND	30	6.7
Maternal outcome		
SAMM	422	93.8
Maternal death	28	6.2
Dystocia		
Obstructed labor	95	21.1
Rupture uterus	28	6.2
Impending uterine rupture	39	8.7
Hemorrhage		
Prepartum	50	11.1
Postpartum	136	30.2
Hypertensive disorder	96	21.3
Infection	9	2.0
Stillbirth	197	43.8
Live birth	253	56.2

Table-I. Demographic and clinical characteristics of the study population

Characteristics	Stillbirths	Stillbirths%	B	S.E.	Wald	df	Crude odds ratio				Adjusted odds ratio with age			
							p-value	Exp (B)	Lower	Upper	p-value	Exp (B)	Lower	Upper
Mother age (years)														
21-35y (Ref)	143	39.612			13.261	2	.001							
<20y	31	56.36	.678	.292	5.370	1	.020	1.969	1.110	3.493				
>35y	23	67.64	1.159	.382	9.207	1	.002	3.188	1.507	6.740				
Parity (number)														
1-4 (Ref	87	37.17			9.472	2	.009				.016			
0	53	47.32	.439	.232	3.535	1	.060	1.546	.982	2.436	.040	1.623	1.023	2.573
>4	56	54.36	.700	.240	8.525	1	.004	2.013	1.259	3.220	.011	1.887	1.156	3.081
Education														
Secondary (Ref)	1	4												
No or primary	196	46.11	3.022	1.025	8.691	1	.003	20.541	2.754	153.223	.004	19.378	2.586	145.208
Location														
Karachi (Ref)	160	42.44			2.328	2	.312				.418			
In sindh	21	55.3	.516	.342	2.270	1	.132	1.675	.856	3.278	.188	1.582	.799	3.132
Bloch	16	45.7	.133	.355	.140	1	.708	1.142	.570	2.290	.996	1.002	.490	2.047
Gestational age (weeks)														
>37 weeks (Ref)	170	41.56												
28-36 weeks 6 days	27	65.85	.997	.344	8.393	1	.004	2.711	1.381	5.324	.002	2.994	1.512	5.931
Booking status														
Booked (Ref)	5	10			25.621	2	<0.001							
Non Booked	140	52.43	2.295	.487	22.195	1	<0.001	9.921	3.819	25.773	<0.001	10.101	3.847	26.518
Referred	52	39.09	1.754	.504	12.122	1	<0.001	5.778	2.152	15.509	.001	5.879	2.166	15.954
Dystocia														
No (Ref)	133	46.2			23.782	3	<0.001							
Obstructed labor	64	38.55	-.165	.239	.479	1	.489	.848	.531	1.354	.476	.843	.527	1.348
Rupture uterus	40	42.15	1.252	.452	7.663	1	.006	3.496	1.441	8.482	.002	4.003	1.647	9.729
Impending Uterine rupture	21	75	-2.332	.612	14.497	1	<0.001	.097	.029	.323	<0.001	.104	.031	.346
Hemorrhage														
No (Ref)	127	48.1			44.212	2	<0.001				<0.001			
Prepartum	39	78	1.341	.363	13.661	1	<0.001	3.825	1.878	7.790	<0.001	3.617	1.756	7.451
Postpartum	33	23.91	-1.144	.239	22.986	1	<0.001	.318	.200	.508	<0.001	.306	.190	.493
Mode_cat (1)														
Cesarean (Ref)	87	36.0												
Vaginal deliveries	110	52.9	.693	.193	12.897	1	<0.001	2.000	1.370	2.919	<0.001	1.986	1.351	2.920
Maternal death														
Yes (Ref)	18	64.3												
SAMM	179	42.4	.893	.407	4.830	1	.028	2.444	1.102	5.421	.023	2.546	1.137	5.703
Hypertensive (1)														
No (Ref)	136	38.4												
Yes	61	63.54	1.027	.239	18.548	1	<0.001	2.794	1.750	4.459	<0.001	3.298	2.040	5.330
Infection														
No (Ref)	191	43.3												
Yes	6	66.6	.962	.714	1.819	1	.177	2.618	.646	10.601	.197	2.538	.616	10.455

Table-II. Obstetric risk factors and cause specific stillbirth

stillbirth rate respectively. Impending rupture was found in 9.5% cases with &70|1000 stillbirth rate Infection accounts for 2% of cases with stillbirth rate of 666|1000. Eighty seven (360|1000) stillbirth delivered by cesarean section and 110 (553|1000) delivered vaginally. Uterine rupture prepartum haemorrhage and hypertension were found to be significant (p < .05) obstetric risk factors for stillbirth on multivariate regression analysis after adjusting for co variable.

DISCUSSION

Study group showed high stillbirth rate 438 | 1000 as compared to still birth rate 74 |1000 in rest of the deliveries during the same period in our unit hence factors causing near miss death and death of women are also putting fetus at risk of near miss death and death .

Risk of still birth in cases of maternal deaths was found to be significant emphasizing need to take measures at an earlier stage to prevent stillbirth while attempting to save life of woman with obstetric emergencies[14]. Every hospital should therefore have beforehand protocol to manage promptly acute obstetric emergencies to save lives of both mother & fetus and strategies formed after audit of SAMM & maternal death to prevent maternal morbidity & mortality should also focus on avoiding preventable cause of still births.

Stillbirth rate in the study constitutes more than half (52.4 %) of the total stillbirth during the period which is comparatively less than study by Biodun N. Olagbuji et al[14] which could be due to not including medical disorders in the study group and difference in criteria for labeling SAMM but still it is significant because impact of measures taken following such audits to reduce still birth rate would be expected to be substantial. Analysis of demographic factors showed that extremes of ages i.e under 20 years and particularly more than 35 years were significantly associated with risk of stillbirth as were grand multiparity and nulliparous Similar findings had been found in other studies[17,18,19,20]. Emphasis need to be placed on awareness of couples regarding birth spacing & easy accessibility to family planning options. In this respect Efforts should be on large scale both in urban and rural areas to limit family size.

Majority of women were uneducatedin the study group. As illiteracy is associated with underutilization of health care facilities and poor maternal and perinatal outcome[21,22]. Empowerment of women particularly girls through quality education would be important intervention. Girls like Mala Yousaf Zai should be fully supported because Female literacy rate of Pakistan is 40.3% where as it is only 9% in Baluchistan and 14% in rural areas of sindh. In a local survey[23] it was found that unfortunately most of people do not have awareness to consider illiteracy a problem although it as catastrophic disaster as flood and earth quake Stillbirth rate (670|1000) was very high in unbooked cases as shown in other studies[4] and need for improvement in maternal health care system[24,25]. According to UNICEF (2006-2010) antenatal care coverage(at least four times) is only 28% in Pakistan.

Unfortunately stillbirth rate is also high in referred cases (291|1000) .It is therefore necessary to address issues of delayed referral and substandard management at primary and secondary care hospitals both public and private involved in maternity care. Most of our data is from urban population but proportion of cases coming from Baluchistan and interior sindh has high stillbirth rate. Political will need to be involved In provision of health care facilities to rural areas of Pakistan where as adequate utilization of available facilities in urban areas should be the first priority to improve dysfunctional health system. Preterm deliveries were at significant risk of stillbirths as reported in other studies[26].

Prepartum haemoorhage particularly placental

abruption was found to be significantly associated with stillbirth as also shown in local[20] and international studies[27]. Obstructed labor had high stillbirth rate and significant association was found between stillbirth and rupture uterus[28,29]. Use of partograph for monitoring labor and timely intervention will prevent cases of obstructed labor and impending uterine rupture with previous scar ending up in uterine rupture and stillbirths. Hypertension was associated with increase stillbirth rate in our study as is also concluded to be risk factor in other studies[30]. But in a nationwide study over forty years AS Ahmad et al[31] found that risk of still birth had been greatly reduced. Risk of fetal death in hypertensive disorders during pregnancy can be reduced by close pregnancy surveillance and timely delivery. Infection has high rate of cause specific stillbirth rate. Health care providers involved in maternity care[10]. Vaginal delivery was significantly associated stillbirth in our study. An increased stillbirth risk of four-fold compared to cesarean section has been found in other study[10].

CONCLUSION

Stillbirth rate is very high in SAMM and maternal deaths. Pre partum hemorrhage, Hypertensive disorder uterine rupture & infections were significant risk factors as were grand multiparity extremes of ages lack of prenatal care and illiteracy. More focused strategies can be formed to avoid preventable causes of stillbirth if risk factors for stillbirth are critically analyzed in the audit of SAMM & maternal death.

AUTHOR'S CONTRIBUTION

Author 1 conceived of the study, did the data collection and analysis, wrote the first draft and final paper. Author 2 reviewed final paper. All authors read and approved of the final manuscript.

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A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty.

Sir Winston Churchill (1874-1965)