Perinatal Postmortem: Factors Influencing Uptake and Subsequent Outcomes in an Asian Population

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SUMMARY

Aim: To assess uptake of perinatal postmortems (PM) among mothers experiencing perinatal deaths. Subjective assessment of factors influencing uptake was studied. Analysis of perinatal PM outcomes and its impact on cause analyses of intrauterine fetal demise was made.

Method: 2-year prospective audit on all mothers who had experienced stillbirths at a tertiary centre. Couples returning for their postnatal consultation following their stillbirths were offered a subjective questionnaire on issues pertaining to the request of PM and their decisions on the requests. Outcome of their PMs was collated.

Result: 71 of 87 (81.6%) women with stillbirths in the 2008-2009 (24 months) period were offered PM examination of their babies. The preliminary uptake of perinatal PM was 24 (33.8%) at counseling and but only 12 (16.9%) finally had PMs performed. Perinatal PMs clinched a diagnosis in 5 of 12 cases (42%). Discrepancies existed between external examination by on-site obstetric doctors and subsequent examination by a perinatal pathologist.

Conclusion: Perinatal PM is a valuable tool in the assessment of intrauterine fetal demise. Increasing the perinatal PM uptake may improve care of women with stillbirths. Factors affecting parental decisions are discussed.

INTRODUCTION

Perinatal postmortem (PM) is arguably the single most important investigation in the evaluation of the cause of perinatal deaths [1]. In Malaysia, the perinatal postmortem uptake is low and on the decline [2]. No studies have looked into the reasons for the low uptake. The subject of PM is, as most of us in the field would testify, a difficult one to bring to bear upon those afflicted. The reason(s) for this could be assumed to be nestled under the umbrella of culture and believes. Little is actually known from systematic study. This paper provides an insight into issues surrounding the discussion and offer and subsequent uptake of perinatal PMs. It also summarizes the outcomes of perinatal PMs performed at Sabah Women & Children Hospital Kota Kinabalu (SWACH).

MATERIALS AND METHODS

SWACH is a tertiary hospital with 13,000 deliveries a year. The perinatal mortality rate in the Kota Kinabalu region is 13 per 1000 livebirths. Of these, 67% is due to stillbirths. Protocols exist for the investigation and management of these mothers with intrauterine fetal demise (IUD). This study looked at uptake and outcome of perinatal PMs. It is a prospective observational study. All mothers with IUDs are subjected to an existing protocol where they are offered investigations to ascertain the cause of fetal death. The protocol also states that a perinatal PM be offered to all mothers who experienced a stillbirth beyond 22 weeks of gestation or a fetal weight of 500 grams. All the PMs were performed by a dedicated pathologist with an interest in perinatal pathology. The patient management flow is given in Figure 1.

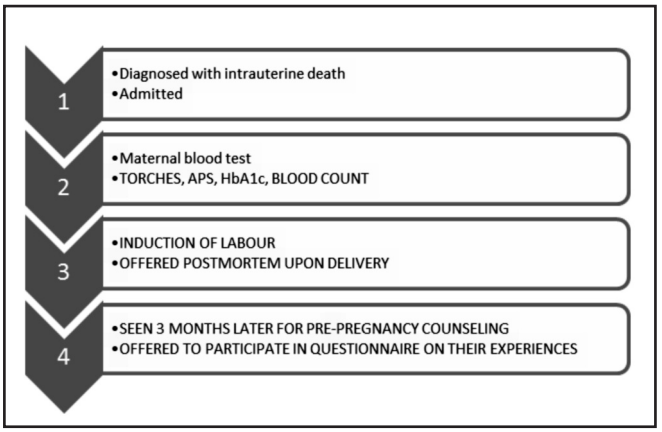

Fig. 1

Figure 1

The trends in staff involvement in perinatal PM discussions and uptake and subsequent results are collated. There was no dedicated team or personnel dealing with patients with IUD at the time of the study. Patients are usually seen in the admission centre and registered by front desk staff as all other patients. Following confirmation of the IUD by the registrar on duty and discussion with specialist the patient would be admitted for investigations and induction of labour which is usually commenced the following day.

3 months after delivery the couples were seen in the pre-pregnancy clinic where data would be collated and the couple given a short subjective questionnaire as to their experiences pertaining to the issue of PM. This questionnaire was designed and piloted on women with stillbirths prior to the study period. The questionnaire is a subjective one based on patient recollection of their responses surrounding the discussion and offer of a PM.

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Women/couples were invited to give their responses on the following:

1. Appropriateness of information provided for the need of postmortem
2. If the offer of a postmortem saddened them
3. If the offer of a postmortem angered them

This questionnaire is in Bahasa Malaysia and it is available on request. As the numbers involved are small no statistical analysis was required.

This study received approvals from the local and national Medical Research Ethics Committee of the Ministry of Health of Malaysia and is registered as study NMRR-08-1605-2499 on the National Medical Research Registry.

RESULTS

The number of IUDs captured for the duration of the study was 87. Of the 87 stillbirths captured, PM was offered to a total of 71(82%). Only 12 (16.9%) had a PM performed. 46 patients who had returned to the pre-pregnancy consultation agreed to the study and participated in the questionnaire. The non-attendance rate for women with IUDs was 61%. Of the 46 PM offered 29(63%) were offered by doctors (house officers [HOs] and medical officers [MOs]-registrars) and 16(35%) offered by specialists (Sp) with one offered by a staff nurse.

Feedback on PM request discussions of the 46 interviewed: 10 (22%) felt that explanations given were poor. An additional 29 (66%) felt the explanations on PM request were merely satisfactory. Only 10 (22%) thought that the explanation for PM was good. These 10 were counseled by specialists.

On questioning for negative reactions, one third (18, 39%) thought they were very saddened by the requests, another third (14, 30%) only slightly saddened with the remaining third (14, 30%) saying they were not affected by the requests. On questioning for positive reactions, 7(16%) were very angered by the requests, 10(22%) were slightly angered by the request while the remaining 29(72%) feeling that the PM requests did not affect their feelings.

Couples were also asked about on the issue of postmortem examination (PME) introduced by staff. 42 (79.2%) were offered a PME. Of these (33/62.3%) were approached by junior grade doctors with specialists involved in 17 (32%). 11 (20.7%) thought that the information given on the PME was poor with the remaining 42 (79.3%) report as merely satisfactory. Couples were asked if they were given formal counseling on the management of IUD, including need for a PME. 47 (88.6%) were not counseled on the general approach for investigating and subsequent management of IUDs. Ultimately only 15 (28.3%) preliminarily agreed to a PME with a final uptake of 12 (21%).

On reasons for rejecting the postmortems 15 (28.3%) cited religious concerns, 2 (3.8%) cultural, 9 (17%) family decisions, 23 (43.4%) personal reasons and the remaining 4 (7.5%) cited other reasons not listed in the questionnaire.

Table I: Reasons postmortem rejected

Factor	n (%)
Religious	13 (28)
Culture	2 (4)
Family consensus (elders)	6 (14)
Personal	22 (48)
Others not elaborated	3 (6)

Table I details the reasons given for rejecting the PM requests: Table II details the findings of PMs conducted, n=12

DISCUSSION

PM remains a sensitive issue to be discussed at such a difficult time for parents.4 It also has been shown that in spite of this women/couples are receptive to postmortems given adequate input [5]. Although the majority of patients were receptive to the discussion 16% were rather angered or saddened (69%) by the requests. Healthcare workers need to be aware of these potential responses when bringing up the issue despite the majority not being emotionally affected.

The uptake of PM in this series was low at 17%. There are few possible reasons for this. 1) The policy of the hospital is to generally admit all couples for delivery as soon as possible. Couples would have had little time to dwell on PM and implications of declining it. The argument against allowing time would be the fact that PM objectivity declines with tissue apoptosis. 2) The grade of staff discussing this sensitive request was not optimal with 65% of PMs requests handled by junior or middle grade doctors and nurse. Informed counseling by specialist grade or a dedicated counselor could yield higher acceptance. 3) patient-described factors as per table I. Although the majority declined PM examinations for personal reasons (48%), culture and religion were not infrequently cited as reasons. The extended family may play a significant role in decision making. Increased background understanding of patients' culture and religious backgrounds may facilitate discussions on difficult issues [4,6].

The impact of perinatal PM on the eventual conclusion is significant. In 5 of the 12 (33%) the PM descriptions changed the final diagnosis. This is in keeping with published observations[1]. Perinatal postmortems also provided confirmatory evidence on diagnoses [1].

Of note is the fact that gross descriptions of fetuses by on-site obstetric doctors were misleading in cases 2,3,5,6 and 12. PMs in these cases revealed contradicting or additional pathology. It could be argued that thrombosis in case 12 would not have had an external manifestation. Despite this it has to be concluded that the unsupervised or unsystematic external examination by on-site staff may limit the sensitivity of those observations. More structured examination checklists may be the answer for a more systematic and thorough examination with improved clinicopathological sensitivity [7]. It may be simply that more experience is needed when looking for pathology in a dead fetus.

Table II: Description of Perinatal Postmortem results

No	M/FSB at Birth	Gross Description (Front line Obstetric team)	Perinatal PM diagnosis	Autopsy Conclusion	Final Conclusion
1	FSB	Grossly deformed baby with abdominal distension	Urethral atresia, obstructive renal dysplasia, hypertrophied bladder, urinary ascites, pulmonary hypoplasia	Early neonatal death due to pulmonary hypoplasia	Potter IV obstructive renal dysplasia
2	MSB	Grossly normal fetus. Erythematous.	Generalized petechial hemorrhages. No congenital malformations. Lungs: petechial hemorrhages over surface. Left lung appears darker. Both lungs appear unhealthy on cut surface. Microscopy reveals inflammation.	Normal macerated stillborn fetus	Congenital infection.
3	MSB	Normally formed fetus	Gross midline palatal cleft.	Otherwise normal macerated stillborn	Cause of death not ascertained
4	MSB	Normally formed fetus	Normally formed fetus. Severe thinning of cord for 2 cm at cord insertion site to fetus. Absent Wharton jelly at this segment. Abrupt absence of Wharton jelly at mid-cord (1 cm segment). Intra-abdominal umbilical vein and arteries normal. Kidneys and bladder normal.	Cord malformation – absent / deficient wharton's jelly	Wharton jelly deficiency / absence causing vascular accident.
5	MSB	Normally formed fetus. Retroplacental clot.	Pale body. Subdural hematoma right cerebral hemisphere. Blood-stained fluid infiltration of lungs.	Intracranial hemorrhage	Abruptio placenta.
6	MSB	Hydropic fetus.	Short neck. Short upper and lower limbs. Widely spaced eyes and flat nasal bridge. Short stubby fingers. Possible rocker-bottom feet. Hypospadias with scrotal meatus. Multiple enlarged cervical lymph nodes and hepatosplenomegaly with petechial hemorrhages of lung parenchyma.	Achondroplasia Intrauterine infection	Intrauterine infection
7	MSB	NA	Normal fetus		Cause of death not ascertained
8	MSB	NA	Clinodactyly of 5th digits both hands. Limbs: Fixed flexion contractures of hip and knee joints. Flexion caused by skin and soft tissue pterygium over antecubitals and popliteals. Rockerbottom feet bilaterally. Internally normal. Hydropic.		Lethal multiple pterygium syndrome (LMPS)
9	MSB	Hydropic.	Fluid filled third spaces (ascites and pleural effusion). Structurally normal fetus	Normal hydropic macerated stillborn	Cause of death not ascertained
10	MSB	Normally formed fetus	Undescended testes. Structurally normal fetus. Gestational age not corresponding to weight. Sternum ossification centres not formed.	Normal macerated stillborn probably less than 24 weeks gestation at death.	Cause of death not ascertained
11	MSB	IUGR with anhydramnios on scan. Spalding positive	Dolicocephaly. Thoracic: Abdominal circumference ratio <0.1. Generalized limb contractures. Absent mesocolon at cecum and ascending colon. Horseshoe kidney. Ureters and renal vessels present. Kidney slides: normal renal tissue. Brain autolysed	Possible lung hypoplasia from anhydramnios.	Cause of death not ascertained
12	MSB	Normal fetus	Tracheo-oesophageal fistula. Thrombosed umbilical vein extending up to intra-hepatic segment.	Structurally normal macerated stillborn.	Possible thrombosis of umbilical vein

MSB macerated stillbirth FSB fresh stillbirth

Case Descriptions

2. On further questioning mother recalls vague flu-like symptoms one week prior to reduced fetal movements
3. Maternal pre-eclampsia requiring magnesium sulphate peripartum.
5. It could be argued that abruption occurred during delivery as there were neither history nor clinical evidence to support this at presentation. However, the pale fetus with blood filled lungs are evidence that the abruption occurred pre-mortem. The subdural hemorrhage was probably secondary to fetal coagulopathy secondary to exsanguination.
6. A babygram for skeletal survey ruled out achondroplasia after normal long bone ratios.
8. No babygram to assess bony malformations for sub-typing LMPS
11. Lung hypoplasia: systematic reporting of weight / histologic description may clinch diagnosis of lung hypoplasia.
12. Where infection was the most likely cause of death the precise offending organism have not been sought beyond the routine cultures (microbiology) and TORCHES serology

*** Note: All Blood Tests (Blood Counts, Torches Serology, Antiphospholipid Screening And Fetal Swabs For Culture Were Normal And Negative Respectivel

Perinatal pathologists are rare in any setting but essential for perinatal services. The joint Working Committee of the Royal Colleges of Obstetricians & Gynaecologists and Pathologists identified this as a pressing issue and recommended development of national training and service provisions back in 2001[8]. There are no perinatal pathologist specialists in the setting described. The outcomes in the described cases are positive due to close collaboration between the obstetricians and a dedicated pathologist with an interest in perinatal PMs. In some of the cases described there were no conclusions on the part of the pathologist, merely descriptions. Fitting in the antenatal, clinical and delivery details completed the jigsaw in almost all the cases. Continued and sustained collaboration such as this would see the birth of future perinatal pathologists and subsequent training centres. The recent Lancet Stillbirth Series steering committee commentary recommended high quality autopsy services as a necessity to reducing stillbirth rates[7].

PM cannot remain the sole tool for the obstetrician deciphering the cause of perinatal stillbirths. A structured multidisciplinary approach involving clinical examination, laboratory and histopatholical testing and postmortem improves aetiological detection rates. It cannot be over-emphasized that PM remains the single most important investigation for IUD as is highlighted in this series. Efforts should be taken to improve service delivery to ultimately increase PM uptake. Information is the key to patient decision making. Quality of information provided and the manner in which it is provided may hold the key to improved PM uptake.

The observations made are not viewed as conclusive as there remained a cohort of patients that declined all attempts to ascertain cause of fetal death. There were also some who declined follow-up taking their views with them. Only 87 (64%) of an estimated 135 cases were captured. Not all patients agreed to have investigations. Not all patients returned for their postnatal visit. The high rate of patients declining to attend follow-up (61%) may represent grief or simply loss of confidence in the system that was meant to deliver but failed instead, both of which need urgent address.

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Conflict of interest: None

REFERENCES

1. Killeen OG, Burke C, Devaney D, Clarke TA. The value of the perinatal and neonatal autopsy. Ir Med J. 2004; 97(8): 241-4.
2. Tan GC, Hayati AR, and Khong TY. Low perinatal autopsy rate in Malaysia: time for a change. Pediatr Dev Pathol. 2010; 13(5): 362-8.
3. Hickey K, Gillan J. Should perinatal postmortems be carried out by specialist pathologists. Br J Obstet Gynaecol. 1995; 102(9): 757-8.
4. Chichester M. Requesting perinatal autopsy: multicultural considerations. MCN Am J Matern Child Nurs. 2007; 32(2): 81-6; quiz 87.
5. Breeze ACG, Statham H, Hackett GA, Jessop FA, Lees CC. Attitudes to perinatal postmortem: parental views about research participation. J Med Ethics. 2011;
6. Gordijn SJ, Erwich JJHM, Khong TY. The perinatal autopsy: pertinent issues in multicultural Western Europe. Eur J Obstet Gynecol Reprod Biol. 2007; 132(1): 3-7.
7. Flenady V, Middleton P, Smith GC, Duke W, Erwich JJ, Khong TY *et al*. Stillbirths: the way forward in high-income countries. Lancet. 2011;
8. http://www.rcog.org.uk/files/rcog-corp/uploaded-files/WPRFetalPathology2001.pdf