

Editorial

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Managing stillbirth: taking care to investigate the cause and provide care for bereaved families

<https://doi.org/10.1515/jpm-2022-0271>

Received June 8, 2022; accepted June 8, 2022

Keywords: investigation; management; perinatal death; stillbirth.

When a stillbirth occurs, irrespective of the setting, women and their families should receive appropriate, respectful care [1]. The nature of this care will vary between settings and individual families' needs. However, access to investigations to determine the cause of the baby's or babies' death is an important part of care for parents after stillbirth, as this can help parent's understand the reasons for their baby's death but can also provide information regarding the management of subsequent pregnancies [2, 3]. The papers presented in this special edition highlight the importance of access to autopsy, placental examination and using the mother's history to direct other investigations.

Tiwani et al. report placental findings in 250 singleton stillbirths in India, and compare them to 250 live born infants. In this setting, small for gestation age infants and infants with congenital anomalies were more frequent in cases of stillbirth, as were abnormalities of the umbilical cord [4]. Similar to studies in high-income countries [5], this study found that placental abnormalities were seen in live born infants but were much more common in stillbirths including maternal and fetal vascular malperfusion and chorioamnionitis. This study demonstrates the importance of placental histopathological examination in cases of stillbirth. Siassakos et al. examined cases of distal villous immaturity (DVI), a rare placental lesion (1.5% of all placental reports studied) [6]. As with the placental abnormalities described by Tiwani et al. DVI was associated with stillbirth. Importantly, there appears to be a relationship with abnormal glycaemic control. Thus, as well as

description of individual placental abnormalities these must be interpreted relative to the clinical context; further work is needed to determine how the maternal environment alters maternal phenotype.

Autopsy is regarded as the gold-standard examination following stillbirth. Ozdemir et al. reviewed 190 cases of termination of pregnancy for central nervous system abnormalities. They found that in 1% of cases autopsy added minor additional information, but in 3% of cases information was provided that provided a major change to the diagnosis [7]. However, the study also noted significant limitations that abnormalities of the central nervous system cannot always be confirmed or refuted at post-mortem due to tissue degradation. Critically, minimally-invasive autopsy using magnetic resonance imaging may be able to obtain detailed structural information about the central nervous system which may continue improve in postnatal investigation of stillbirth and fetal death [8]. Branco et al. used cardiac tissue obtained at autopsy to determine that the expression of two cardiac ion channels are reduced in cases of otherwise unexplained stillbirth [17], providing a link between studies that have identified mutations in these genes in similar cases, and possible disturbances in electrical conduction [9]. This novel area requires further study to determine whether cardiac channelopathies may underpin unexplained stillbirths.

Other investigations to determine the cause of stillbirths are variably employed. In their review of over 198,000 stillbirths in Mexico between 2008 and 2019 Herrera-Salazar et al. found between 34.4 and 41.9% were unexplained [10]. The authors note that only 19 cases were attributed to viral infection, which likely represents an underestimate given the established links between *in utero* infection, congenital abnormality and fetal deaths. This emphasises the need for medical history, maternal examination, autopsy and placental examination to determine a reliable cause of death.

In their review of major international guidelines for the management of stillbirth Tsakiridis et al. found agreement that medical history should be reviewed and that autopsy, histopathological examination of the placenta, genetic analysis and microbiology should be offered to parents [11].

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Their analysis also identified discrepancies on testing for thyroid function and maternal viral screening, highlighting important gaps in evidence available to inform clinicians and parents about which tests are most likely to provide information about the cause of the baby/babies deaths. Studies are particularly needed in high-burden settings to determine the most informative investigations to identify cause of death and inform future care.

The care of parents following a stillbirth is not currently informed by high-grade evidence as noted by the Cochrane review [12, 13]; randomised studies in this area would be challenging to undertake, thus descriptive studies are important to understand as much as possible about women's and families experience of care. Critically, identifying important aspects of care to parents gives focus to develop interventions that may reduce the psychological, economic and social burden of stillbirth [1].

In a case control study, Pekkola et al. studied 214 cases of stillbirth in Finland and found that in comparison to live births induction of labour was much more common and Caesarean birth less frequent [14]. Cases of stillbirth had shorter labours, but blood transfusion was required more frequently perhaps due to the higher rates of placental abruption. In this context, the rates of serious maternal complications were low. This information can enable other services to understand the resources required to provide intrapartum care for women whose baby/babies have died. To this end it is important to understand that needs are not the same as intrapartum care for a live born infant, but one to one midwifery and appropriate maternal surveillance is essential to a safe birth environment.

While clinical care and management are essential for safe birth and to find a cause of stillbirth, these objective elements of care are less strongly associated with maternal perception of care quality than subjective evaluation. Cassidy surveyed the experiences of 610 women from Spain and found the three strongest predictors of care quality were: feeling free to express emotions, perceived teamwork between members of the multi-disciplinary team and being well informed of all steps and procedures [15]. This emphasises the need for holistic, respectful care for women and their families after a baby has died. Boyle et al. describe the impact of the COVID-19 pandemic on perinatal bereavement care in Australia, finding 8 out of 49 guidelines were affected, including reduced support for mothers including less access to interpreters, reduced options for memory making and staff training [16]. As these aspects closely relate to the factors identified by Cassidy it is likely that

these changes would have impacted negatively on parents' perception of perinatal bereavement care.

The quality of care provided after the death of a baby impacts on the longer-term outcomes for mothers and their families. It is essential that investigations after perinatal death are accessible and form part of a management plan that addresses parents' emotional and psychological needs, which should not be perceived as an optional extra. It is hoped that the wide scope of the papers from a range of settings here provide further basis to develop optimal care after the death of a baby.

Research funding: None declared.

Author contributions: The author has accepted responsibility for the entire content of this manuscript and approved its submission.

Competing interests: Author states no conflict of interest.

References

1. Heazell AE, Siassakos D, Blencowe H, Burden C, Bhutta ZA, Cacciatore J, et al. Stillbirths: economic and psychosocial consequences. *Lancet* 2016;387:604–16.
2. Graham N, Stephens L, Johnstone ED, Heazell AEP. Can information regarding the index stillbirth determine risk of adverse outcome in a subsequent pregnancy? Findings from a single-center cohort study. *Acta Obstet Gynecol Scand Suppl* 2021;100:1326–35.
3. Heazell AEP, McLaughlin MJ, Schmidt EB, Cox P, Flenady V, Khong TY, et al. A difficult conversation? The views and experiences of parents and professionals on the consent process for perinatal postmortem after stillbirth. *BJOG An Int J Obstet Gynaecol* 2012;119:987–97.
4. Tiwari P, Gupta MM, Jain SL. Placental findings in singleton stillbirths: a case-control study from a tertiary-care center in India. *J Perinat Med* 2022;50:753–62.
5. Pathak S, Lees CC, Hackett G, Jessop F, Sebire NJ. Frequency and clinical significance of placental histological lesions in an unselected population at or near term. *Virchows Arch* 2011;459:565–72.
6. Siassakos D, Bourne I, Sebire N, Kindinger L, Whitten SM, Battagliolo C. Abnormal placental villous maturity and dysregulated glucose metabolism: implications for stillbirth prevention. *J Perinat Med* 2022;50:763–8.
7. Ozdemir O, Aksoy F, Sen C. Comparison of prenatal central nervous system abnormalities with postmortem findings in fetuses following termination of pregnancy and clinical utility of postmortem examination. *J Perinat Med* 2022;50:769–76.
8. Sheldermine SC, Hutchinson JC, Arthurs OJ, Sebire NJ. Latest developments in post-mortem foetal imaging. *Prenat Diagn* 2020;40:28–37.
9. Munroe PB, Addison S, Abrams DJ, Sebire NJ, Cartwright J, Donaldson I, et al. Postmortem genetic testing for cardiac ion channelopathies in stillbirths. *Circ Genom Precis Med* 2018;11:e001817.
10. Herrera-Salazar A, Flores-Hernandez LA, Valdespino-Vazquez MY, Fonseca-Coronado S, Moreno-Verduzco ER. Viral infections in stillbirth: a contribution underestimated in Mexico? *J Perinat Med* 2022;50:786–95.

11. Tsakiridis I, Giouleka S, Mamopoulos A, Athanasiadis A, Dagklis T. Investigation and management of stillbirth: a descriptive review of major guidelines. *J Perinat Med* 2022;50:796–813.
12. Horey D, Flenady V, Heazell AE, Khong TY. Interventions for supporting parents' decisions about autopsy after stillbirth. *Cochrane Database Syst Rev* 2013;2:CD009932.
13. Koopmans L, Wilson T, Cacciatore J, Flenady V. Support for mothers, fathers and families after perinatal death. *Cochrane Database Syst Rev* 2013;6:CD000452.
14. Pekkola M, Tikkanen M, Gissler M, Loukovaara M, Paavonen J, Stefanovic V. Delivery characteristics in pregnancies with stillbirth: a retrospective case-control study from a tertiary teaching hospital. *J Perinat Med* 2022;50:814–21.
15. Cassidy PR. Beyond emotional support: predictors of satisfaction and perceived care quality following the death of a baby during pregnancy. *J Perinat Med* 2022;50:832–43.
16. Boyle FM, Horey D, Dean JH, Lohan A, Middleton P, Flenady V. Perinatal bereavement care during COVID-19 in Australian maternity settings. *J Perinat Med* 2022;50:822–31.
17. Branco SQ, Batra G, Petts G, Hancock A, Kerby A, Brady CA, et al. Cardiac ion channels associated with unexplained stillbirth – an immunohistochemical study. *J Perinat Med* 2022;50:777–85.