Women and Birth (2010) xxx, xxx–xxx

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Holistic physiological care compared with active management of the third stage of labour for women at low risk of postpartum haemorrhage: A cohort study

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Received 30 November 2009; received in revised form 3 February 2010; accepted 3 February 2010

KEYWORDS
Labour, third stage;
Physiological third stage care;
Midwifery models;
Birth centre care;
Labour

Summary
Question: Is 'holistic psychophysiological care' in the third stage of labour safe for women at low risk of postpartum haemorrhage?.
Background: Although there have been four randomised trials and a Cochrane Review on the safety and effectiveness of care during the third stage labour, no previous study has focussed only on women at low risk of postpartum haemorrhage and no previous study has tested a form of physiological third stage care that is provided by skilled midwives in an appropriate setting.
Design: Retrospective cohort study involving a maternity unit at a tertiary referral hospital and a freestanding, midwifery-led birthing unit.
Participants: All low risk women who gave birth at either unit in the period July 2005–August 2008.
Interventions: 'Active management' of the third stage of labour compared with 'holistic psychophysiological third stage care'.
Results: At the tertiary unit, 344 of 3075 low risk women (11.2%) experienced postpartum haemorrhages (PPH). At the midwifery-led unit, PPH occurred for 10 of 361 women (2.8%), OR = 4.4, 95% CI [2.3, 8.4]. Treatment received analysis showed that active management (n = 3016) was associated with 347 postpartum haemorrhages (11.5%) compared with receiving holistic psychophysiological care (n = 420) which was associated with 7 (1.7%) PPH OR = 7.7, 95% CI [3.6, 16.3].
Conclusion: This study suggests that 'holistic psychophysiological care' in the third stage labour is safe for women at low risk of postpartum haemorrhage. 'Active management' was associated with a seven to eight fold increase in postpartum haemorrhage rates for this group of women.

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1871-5192/$ – see front matter © 2010 Published by Elsevier Australia (a division of Reed International Books Australia Pty Ltd) on behalf of Australian College of Midwives.
doi:10.1016/j.wombi.2010.02.003

Please cite this article in press as: Fahy K, et al. Holistic physiological care compared with active management of the third stage of labour for women at low risk of postpartum haemorrhage: A cohort study. *Women Birth* (2010), doi:10.1016/j.wombi.2010.02.003

Further prospective observational evaluation would be helpful in testing this association.

Introduction

This study was set in the state of New South Wales (NSW), Australia, where, unless a woman gives informed refusal, active management of the third stage of labour is mandated by the Department of Health.[1] This paper reports on a cohort study which compared the postpartum haemorrhages (PPH) rates of a tertiary referral maternity unit, which uses active management of the third stage of labour and a midwifery-led, freestanding birthing unit where psychophysiological third stage labour care is commonly used. The reporting of this study is somewhat different from standard reporting because the topic is controversial and complex. Given that there has been a number of randomised trials and a Cochrane meta-analysis on active management versus expectant management of the third stage of labour it has been necessary to justify this cohort study. Two previous papers have been published that are germane to this research report. One paper is a detailed critique of the Cochrane Review.[2,3] The other paper is a biologically based theoretical paper which describes what midwives mean by 'physiological' third stage care (termed 'holistic psychophysiological care'[4] to distinguish it from what Prendiville et al. termed 'expectant management' of the third stage of labour). This paper focuses mainly on the cohort study we conducted. The paper begins by summarising the literature search and the key findings of that search. Next we present a discussion of the main critiques which we have made to justify the present study. The findings of the study are then presented and the strengths and limitations are discussed. Finally, we argue that in the absence of better evidence for low risk woman our study suggests that 'holistic psychophysiological care' in the third stage of labour is safe for women who at low risk of postpartum haemorrhage.

Literature search strategy

The literature search was conducted from February to August 2008. The databases searched were Cochrane, Medline, Pubmed, and CINHAL. Search terms were derived from the Cochrane Pregnancy and Childbirth Group search strategy[5] In order to identify all possible randomised controlled trials the key words 'research' 'clinical trial' or 'random*' were used in combination with labour or labor; third stage. The key words 'active management' and 'expectant' or 'physiological' were also used. Studies were eliminated if they were conducted in the developing world; or if they were observational or retrospective. Only articles written in English; relating to randomised trials conducted within the last 20 years concerning the effectiveness of third stage labour care where an oxytocic injection was compared with expectant or physiological care within the last 20 years were selected for inclusion in this review. Included studies used Syntocinon; Syntometrine or Ergometrine in the 'active management arm' and compared that with 'expectant' or 'physiological management' in the other arm. Studies involving misoprostol were excluded. Four randomised trials of the effectiveness of third stage of labour care were retrieved.[6–9] The Cochrane Review of active management versus expectant management of the third stage of labour; which was based on these four trials; was also retrieved.[3] No new trials were found.

Since our cohort study began, the Cochrane Review[3] has been withdrawn. The research concerning the active and expectant management of third stage is currently under re-review by a new team of Cochrane reviewers. However, The NSW Department of Health policy is largely based on the 2000 Cochrane meta-analysis[3] of four randomised trials.[6–9] In the absence of any new evidence, the Cochrane Review and the studies underpinning it, still have sway in practice and so need to be critiqued and reviewed for the present study. In brief, the Cochrane meta-analysis reported on the combined health outcomes for 6284 women who were randomly assigned to receive either active or expectant management in the third stage of labour. The major finding of the Cochrane meta-analysis was that active management of the third stage of labour was associated with a lower PPH rate of 5.2% compared to 13.5% for expectant management (relative risk 0.38, 95% confidence interval 0.32–0.46).[3] Our main critiques are summarised and discussed below.

One important critique[2] is that in the Cochrane Review, the terms 'physiological management' and 'expectant management' are used synonymously. The Cochrane Review had a minimal definition of what is involved in 'expectant management' i.e. (i) a 'hands off' policy, (ii) the signs of separation are awaited, (iii) the placenta is allowed to delivery spontaneously.[3] This definition is not accepted by midwives because the 'expectant management' definition leaves out so much that is important to promoting optimal physiological functioning during the third stage of labour.[4,10,11] We have published a theory which described and explains how to optimise physiological third stage labour so as to minimise PPH.[4] In that paper we theorised a midwifery understanding of holistic 'physiological care' during the third stage of labour. The midwifery understanding of a holistic approach to the care of a woman in the third stage of labour includes all aspects of that woman together with her environment; an approach we have termed 'psychophysiological care' during the third stage of labour. The psychophysiological approach to third stage of labour care is much more sophisticated and physiologically sound than the definition of 'expectant management' used by the Cochrane Review.[4] Using this midwifery theory, 'psychophysiological care' is most beneficial to women when their pregnancy, labour and birth have been normal because if anything upsets the delicate balance of reproductive hormones, there is an increased risk of postpartum haemorrhage and active management is advisable. Another essential element of 'holistic psychophysiological care' in third stage is that the environmental conditions need to be 'right 'in order for the woman's physiology to function optimally; this means that she needs to feel safe, secure, cared about and trusting that her privacy is respected.[4] The

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attending midwife must be knowledgeable and feel confident about optimising psychophysiology during the third stage of labour. The procedure for promoting optimal psychophysiology during the third stage of labour involves: immediate and sustained skin-to-skin contact between the woman and baby who are both kept warm; the midwife gently encourages the woman to focus on her baby whilst maintaining awareness that the placenta is yet to be born; the support people ensure all interactions remain focused on mother and baby; there is 'self-attachment' breastfeeding; the midwife unobtrusively observes for signs of separation of the placenta; there is no fundal meddling or massage; the placenta is birthed entirely by maternal effort and gravity. The midwife or the woman gently 'checks the fundus' frequently for 1 h postplacental birth to ensure contraction and haemostasis. If any part of this 'package of care' is missing or discordant then holistic 'psychophysiological care' has not been able to be provided and active management of labour is advisable.[4] None of the trials underpinning the Cochrane Review defined or controlled the 'expectant management' strategy in the manner we have described as the psychophysiological approach. None of the trials reported on any quality assurance undertaken to ensure that the care was delivered as planned.[2] None paid attention to environmental conditions and, with the exception of the Hinchinbrook trail,[9] the midwives who provide the 'physiological care' had no, or little, training or experience in providing any version of physiological third stage care. This comparison of 'expectant management' and 'holistic physiological care' shows that 'holistic psychophysiological care' was not tested by the Cochrane Review or the underlying randomised trials.

Another important critique is that in all four trials underpinning the Cochrane Review, randomisation of subjects occurred early; before their risk status for PPH could be known with any certainty.[6–9] The percentage of subjects who were at high risk of PPH varied between 15% and 76% of all subjects (see Table 1).[6–9] This high rate of non-compliance with assigned treatment biases the results of the underlying trails and therefore the Prendiville et al. Cochrane Review.[6–9] Generalising findings from a sample of women which included women at high risk of PPH to a population of women who are at low risk of PPH, as the Cochrane Review team did, is unreasonable.[3]

Description of setting and intervention

Both maternity units which provided the data for this study are part of the same Area Heath Service and have excellent consultation and referral relationships. The tertiary maternity unit is a major obstetric and neonatal referral centre for the state. About 4000 babies are born there annually. The tertiary unit contains a birth centre, which at the time of this study, was mostly staffed by midwives working shifts, overseen by the medical staff on duty in the delivery suite. Active management of the third stage of labour is the policy and almost universal practice at the tertiary maternity unit; including the birth centre. The policy states that I.M. Syntocinon should be given within 1 min of the birth of the baby; controlled cord traction is to be used followed by fundal massage after the placenta is born.

The midwifery-led unit, which is the comparator in the present study, is located about 20 min by road from the tertiary unit. The midwifery-led unit is located within a community hospital where there is no obstetric, anaesthetic or paediatric medical officers. This unit is reserved for women who are deemed to be 'low risk' and therefore able to give birth away from immediate medical services (see Table 1 for obstetric risk factors for PPH). Approximately 300 babies are born there annually. All the midwives at the midwifery-led unit are experienced and have been credentialed in advance life support for women and babies; including neonatal intubation, intravenous cannulation and the administration of drugs from an agreed protocol. At the midwifery-led unit, each midwife works in a modified caseload model of care where she is the primary midwife for about 40 women a year and second midwife for another 40 women. Caseload midwifery refers to a woman receiving care from the same midwife, or her partner midwife, 24 h a day, 7 days week.[12] Although caseload is the ideal, most of the women are engaged in a modified caseload/group practice arrangement with their midwife at the midwifery-led unit. Women who choose to birth at this unit do so because they

Table 1 Obstetric risk factors for postpartum haemorrhage.

Previous history of primary postpartum haemorrhage.
Abnormal uterine anatomy: e.g. fibroids, uterine septum, previous uterine surgery including caesarean.
Over distended uterus: due for example to; multiple gestation, big baby or polyhydramnios.
Parity of 6 or greater.
Abnormalities of the placenta: e.g. low lying placenta, placenta praevia.
Antepartum haemorrhage.
Haemoglobin (Hb) of less than 110 g/l.
Abnormalities of coagulation: due to for example to; fetal death in utero, hypertension, clotting diseases, anti-coagulant therapy, antepartum haemorrhage, general infections.
Obstetric or anaesthetic interventions: e.g. induction, augmentation, epidurals, forceps, vacuum, shoulder dystocia, episiotomy or tear requiring suturing.
Intrapartum haemorrhage.
Uterine muscle exhaustion: due for example to induction, augmentation or labour longer than 15 h or maternal exhaustion.
Intra amniotic infection: as indicted by: pyrexia and/or prolonged ruptured membranes (<24 h).
Drug induced uterine hypotonia: e.g. magnesium sulphate, nifedipine and salbutamol.

Reference 1.

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want a natural birth; they want to know their midwife; they like the philosophy of the unit and they want to give birth in an uninterrupted way. The women usually give informed refusal to all drugs in labour; including the third stage. The midwives at the midwifery-led unit have been taught and practice holistic psychophysiological care as described by Hastie and Fahy.[4]

Methods

Institutional ethics approval was granted before the research commenced. A retrospective clinical cohort study was designed using data from the computer-based Midwives data set. This data set forms the basis of all NSW maternity service outcome reports to the Departments of Health. The data concerning risk factors for PPH is entered by the midwives in the antenatal clinic and ward. The data related to labour and birth is entered by the attending midwife within a few hours of the birth.

Institutional ethical approval was granted. Unidentifiable data was obtained for all women who gave birth at the midwifery-led unit in the period July 2005—June 2008. The data from the tertiary maternity unit was only available from January 2006 to June 2008 (a database upgrade had caused data compatibility problems which made it difficult to use data in the period July 2005—January 2006).

The database requires forced choices for many items so that midwives cannot complete the data input without answering. Most variables for this study had completed data however, some categories were not complete. Body mass index was not recorded for 17% of the cohort. We assumed that these women had a BMI under 40 because when there is antenatal concern with possible obesity, then weighing is normally implemented. The length of first and second stage labour was not recorded for 16% of the women at the tertiary unit whereas all the women at the midwife-led unit had data recorded for length of first and second stage. We assumed that if data was not recorded then the labour stage was not prolonged because when labour is prolonged it generates other questions on the database related to interventions in labour which are recorded. 'Number of living children' had to be used as a proxy for 'parity' because the data did not include this variable. The database has no category for the situation when a physiological third stage was commenced but oxytocin was given therapeutically during third stage.

Data analysis

Three analyses were conducted using SPSS. The first involved working with the whole data set to exclude women who were at known risk of PPH because the differences in PPH rates between the two units might be explained by the higher risk

Table 2 Exclusion for risk factors by maternity unit[a].

Exclusion criteria	Tertiary referral unit Total *n* = 9313		Midwife-led unit Total *n* = 431	
	Number	% of JHH total	Number	% of BBS total
CS, forceps, vacuum	3092	33.2%	0	0%
Oxytocin in labour	2601	28%	1	0.2%
Epidural or spinal in labour	1584	17%	0	0%
CS in prior pregnancy	1295	13.9%	0	0%
Hypertension	759	8.1%	1	0.2%
Anaemia in pregnancy	647	6.9%	44	10.2%
Labour stage 1 >13 h	667	7.2%	22	5.1%
Preterm rupture membranes	565	6.1%	0	0%
Two or more fetuses	474	5.1%	0	0%
Poly and oligohydramnios	442	4.7%	1	0.2%
Diabetes	439	4.7%	2	0.5%
APH	381	4.1%	3	0.7%
Labour stage 2 >3 h	339	3.6%	1	0.2%
BMI 40+	338	3.6%	1	0.2%
Complications in labour[b]	208	2.2%	0	0%
Fetal growth restriction	131	1.4%	0	0%
Medical problem[b]	111	1.2%	0	0%
Parity = or >6	96	1.0%	1	0.2%
Red blood cell antibodies	83	0.9%	0	0%
Placenta previa, accreta and percreta	57	0.6%	0	0%
Surgery this pregnancy[b]	31	0.3%	0	0%
Fetal macrosomia	19	0.2%	0	0%
Renal disease[b]	8	0.1%	0	0%
Total excluded	6240	67.0%	70	16.2%

[a] Some women had more than one risk factor.
[b] Decisions made by two researchers based on 2008 Australian College of Midwives referral and transfer guidelines; amount of blood loss at delivery was not known at the time of making exclusion decisions.

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Table 3 Postpartum blood loss by intention-to-treat: low risk women.

Treatment groups and numbers		Postpartum blood loss				
		<500 ml	≥500 < 1000 ml	≥1000 ≤ 1500 ml	>1500 ml	Total PPH
Psychophysiological midwifery-led group (n = 361)	Count	351	7	2	1	10
	% within groups	97.2%	1.9%	0.6%	0.3%	2.8%
Active tertiary hospital group (n = 3075)	Count	2731	257	53	34	344
	% within groups	88.8%	8.4%	1.7%	1.1%	11.2%

status at the tertiary unit. The Australian College of Midwives National Guidelines for Consultation and Referral[13] were used to assist two midwife-researchers to make individual decisions about factors that may pose a risk for PPH such as 'surgery this pregnancy' based on the type of surgery performed. The second and third analyses were conducted on the data for women who were at low risk of PPH. The second analysis was based on quasi intention-to-treat at each unit. 'Active management' was the intention at the tertiary referral unit and 'holistic psychophysiological care' was the intention at the midwifery-led unit. The third analysis was based on 'treatment received' depending upon whether 'active management' or 'holistic psychophysiological care' was provided during third stage of labour; regardless of site. We present the association between the interventions used to manage the third stage of labour as odds ratios with 95% confidence intervals.

Results

The total number of women who gave birth during the study period was 9744. This number was comprised of 431 women for the midwifery-led unit and 9313 women for the tertiary maternity unit. The crude PPH rate for the tertiary unit was 20% and for the midwifery-led unit it was 3%.

We excluded 6240/9313 (67.0%) women at the tertiary unit and 70/431 (16.2%) women at the midwifery-led unit due to possible increased risk of PPH. Table 2 shows the numbers of women who were excluded and the reasons for exclusion. The total number of women who were at low risk of PPH was 3436 comprising 3075 at the tertiary unit and 361 at the midwifery-led unit. The intention-to-treat analysis is presented in Table 3 which shows a PPH rate of 11.2% for active management of the third stage of labour at the tertiary unit compared with 2.8% for holistic psychophysiological care at the midwife-led unit OR = 4.4, 95% CI [2.3, 8.4].

Regardless of the policies and standard practices for third stage care at both units, the intention-to-treat was not always consistent with the treatment actually received. Active management of the third stage of labour was given to 48/361 (13.2%) of the women who gave birth at the midwifery-led unit. Physiological management was given to 107/3075 (3.5%) of the women who gave birth at the tertiary unit (we presume that these were women who had given birth in the birth centre which is within the tertiary maternity unit). The analysis of treatment received is presented in Table 4 which shows the effect on postpartum blood loss of receiving 'active' and 'holistic psychophysiological' interventions both by individual unit and by the combination of the units. Considering both units together, active management of the third stage of labour was received by 3016 women and was associated with 347 postpartum haemorrhages (11.5%). This compares with holistic psychophysiological care which was received by 420 woman and was associated with 7 (1.7%) postpartum haemorrhages OR = 7.7, 95% CI [3.6, 16.3]. The benefit of 'holistic psychophysiological third stage care' compared with 'active management' is apparent at all levels of PPH but most particularly at the ≥500 but <1000 ml level (1.2% versus 8.6%). Within the tertiary unit alone 'holistic psychophysiological care' was associated with 3/107 (2.8%) PPHs compared with 341/2968 (11.5%) PPHs for those women who received 'active management' of third stage labour OR = 4.5, 95% CI [1.4, 14.3].

Table 4 Postpartum blood loss by treatment received: low risk women.

Third stage care	Unit	Number and %	<500 ml	≥500 < 1000 ml	≥1000 ≤ 1500 ml	>1500 ml	Total PPH
Holistic psychophysiological group	Midwife-led n = 313	Count	309	2	1	1	4
		% within unit	98.7%	0.6%	0.3%	0.3%	1.3%
	Tertiary n = 107	Count	104	3	0	0	3
		% within unit	97.2%	2.8%	0.0%	0.0%	2.8%
	Number both units combined		413	5	1	1	7
	% both units combined		98.3%	1.2%	0.2%	0.2%	1.7%
Active management group	Midwife-led n = 48	Count	42	5	1	0	6
		% within unit	87.5%	10.4%	2.1%	0.0%	12.3%
	Tertiary n = 2968	Count	2627	254	53	34	341
		% within unit	88.5%	8.6%	1.8%	1.1%	11.5%
	Number both units combined		2669	259	54	34	341
	% both units combined		88.5%	8.6%	1.8%	1.1%	11.5%

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Discussion

This cohort study involved only women who were assessed as being at low risk of PPH. For this group of women the risk of having a PPH was seven to eight times higher if 'active management' of third stage labour was used compared with 'holistic psychophysiological care'. This finding stands in stark contrast to previous research and a Cochrane Review of third stage care.[2–6] Some readers may be tempted to dismiss our findings because the data was collected by a non-randomised design. However, the tendency to limit knowledge to only that which can be tested via randomised trials would undoubtedly bias the evidence toward interventions that seem simple and easy to define and measure; in the case of the third stage of labour trials this apparent simplicity is illusory. Maternity care practices and the contexts of care are highly complex. In addition, behaviourally based interventions such as third stage care are not easy to define and even less easy to control. We contend that a cohort study has the advantage of reflecting real world practice. Interventions that can be studied under randomised conditions are not necessarily the safest and most effective interventions and they are not necessarily cost effective.[14] The challenge in cohort studies is to make valid inferences about cause and effect in the presence of known and unknown confounders. Our aim in reporting this cohort study has been to be open and transparent so that possible confounders can be identified and discussed.

For women who are at low risk of postpartum haemorrhage and who want to have holistic psychophysiological third stage care, the results of the present study are more trustworthy than those of previous studies. This trustworthiness is because, as argued above, the randomised trials concerning 'active' versus 'expectant' management of the third stage of labour cannot satisfactorily be generalized to this specific group of women who are at low risk of PPH. There have been no randomised trials which have tested holistic psychophysiological care in the third stage of labour. If the Cochrane Review is as scientifically robust as assumed, then the findings should accurately predict the effect on PPH rates of both active and physiological management the third stage of labour. Yet the PPH rates at both maternity units in this study are very different from what was predicated by the Cochrane Review.[3] The 3% rate at the midwifery-led unit is much lower than the 13.5% predicted and the 20% rate at the tertiary unit is much higher than the predicted 5.2%.[3] Further, the direction of PPH rates is opposite to what the Cochrane Review predicts i.e. active management seems to be 'causing' more PPHs than holistic psychophysiological care in third stage.

A strength of the present study is that data was analysed both by quasi intention-to-treat, and by treatment received. In the randomised trials underpinning the Cochrane Review only intention-to-treat analyses were done. The problem is that non-compliance with assigned treatment for the expectant management arm was high: ranging from 36%[9] to 66%[6] (non-compliance with active management was virtually zero in all trials). This non-compliance with the assigned treatment means that the 'expectant' arms of the trials actually provided a mixture of 'active' and 'expectant' management of third stage which weakens those studies.[6–9]

Limitations of the present study include well known problems with the accuracy of the estimation of blood loss. The problem of possible under estimation is not unique to this study. Under estimation of the amount of blood loss by the midwives at the midwifery-led unit compared to under-estimated blood loss by midwives at the tertiary maternity unit is certainly possible because their practice has been under intense scrutiny. There is, however, not much evidence to support such a claim. There is some data to refute it however, because the PPH rates for women at the midwifery-led unit were lower than for the tertiary unit at all levels of PPH severity: a woman who has had major PPH would not be able to be 'hidden' because she would be ill. Further, 'holistic psychophysiological care', compared with 'active management' produced lower PPH rates at the tertiary maternity unit as well.

Another limitation of the present study is that it was conducted retrospectively and therefore the researchers did not have control of the interventions. An informal audit, at the tertiary maternity unit, was conducted by a research team midwife. She found widely varying practices concerning how third stage care was provided. For instance, some midwives, who thought they were providing 'holistic psychophysiological care' did not provide skin-to-skin contact, did not ensure early breastfeeding and some pulled on the umbilical cord. Practices for the active management of third stage were observed to range from those that exactly fit the definition of the Cochrane Review (above) to wide variations from it. There seems to be no agreement among clinicians about when to put tension on the cord and apply counter-pressure to the uterus; some wait for signs of separation and other do not. Some clinicians cut the cord as soon as an oxytocic is given and others do not. Some delay the oxytocic injection until the cord stops pulsating whereas others clamp and cut the cord as soon as possible.

We cannot know how many of the 48 women who are described as having had 'active management' at the midwifery-led unit actually started out with 'holistic psychophysiological care' but oxytocin was given therapeutically in third stage. However, given the small numbers of women who had active management and the small number of PPH at the midwifery-led unit, the potential to bias this study is small. We are confident that the model of 'holistic psychophysiological' care (described in the section on key terms above) is a good description of what occurs at the midwifery-led unit because a great deal of education in the model preceded the midwives providing 'holistic psychophysiological' third stage labour care.

We are careful in our knowledge claims. Care should be taken when attempting to generalise the findings of this study to other settings. That is because the package of care that makes up 'holistic psychophysiological' third stage care is both holistic and very specific. Only women who are still at low risk of PPH at the end of second stage labour are eligible to be safely offered this choice. 'Holistic psychophysiological' care must be provided in its entirety: a piecemeal approach is not the same and may actually cause PPH. Only midwives who have the requisite knowledge, attitudes and skills should offer holistic psychophysiological care to women.

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Conclusion

This study suggests that 'holistic psychophysiological care' in the third stage labour is safe for women at low risk of postpartum haemorrhage. 'Active management', by comparison, was associated with a seven to eight fold increase in postpartum haemorrhage rates for this group of women. Further prospective observational evaluation would be helpful in testing this association. We acknowledge that this study is controversial and welcome well-reasoned scientific arguments in the public domain in the interests of promoting optimal third stage labour care for women and babies.

Ethical statement

Full ethical approval was given for this study by the Ethics Committee of Hunter New England Health.

References

1. Director General. Policy Directive. *Postpartum haemorrhage (PPH) framework for prevention, early recogniton and management*. New South Wales Health. 2005; Sydney.
2. Fahy K. Third stage of labour care for women at low risk of postpartum haemorrhage. *Midwifery and Women's Health* 2009;**54**(5):380—6.
3. Prendiville D, Elbourne D, McDonald S. Active versus expectant management in the third stage of labour. *The Cochrane Database of Systematic Reviews* 2003;**3**. 10.1002/14651858http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD000007/frame.html. [Article number CD000007].
4. Hastie C, Fahy KM. Optimising psychophysiology in the third stage of labour: theory applied to practice. *Women and Birth* 2009;**22**(3):89—96.
5. Cochrane Pregnancy and Childbirth Group. *About the Cochrane Collaboration Cochrane Review Groups* [serial on the Internet]. 2005;**4** (Article No 4: PREG). Available from: www.mrw.interscience.wiley.com/cochrane/clabout/articles/PREG/frame.html. Accessed 20th January, 2009.
6. Begley C. A comparison of 'active' and 'physiological' management of the third stage of labour. *Midwifery* 1990;**6**(1):3—17.
7. Khan G, John I, Wani S, Doherty T, Sibai M. Controlled cord traction versus minimal intervention techniques in delivery of the placenta: a randomised controlled trial. *American Journal of Obstetrics and Gynaecology* 1997;**177**(4):770—4.
8. Prendiville W, Harding J, Elbourne D, Stirrat G. The Bristol third stage trial: active versus physiological management of third stage of labour. *British Medical Journal* 1988;**297**(6659):1295—300.
9. Rogers J, Wood J, McCandlish R, Ayers S, Truesdale A, Elbourne D. Active versus expectant management of third stage of labour: the Hinchingbrooke randomised controlled trial. *The Lancet* 1998;**351**(9104):693—9.
10. Fry J. Physiological third stage of labour: support it or lose it. *British Journal of Midwifery* 2007;**15**(11):893—5.
11. Gyte G. Evaluation of the meta-analyse on the effects, on both mother and baby, of the various components of 'active management of the third stage of labour. *Midwifery* 1994;**10**(4):183—99.
12. Morgan M, Fenwick N, McKenzie C, Wolfe C. Quality of midwifery led care: assessing the effects of different models of continuity on women's satisfaction. *Quality in Health Care* 1998;**7**(2):77—82.
13. Australian College of Midwives. *National midwifery guidelines for consultation and referral*. 2008; http://www.midwivesorgau/ForMidwives/PracticeGuidelines/tabid/308/Defaultaspx. Accessed 15th January 2009.
14. Jaris DC, Lyles C, Crepaz N. Improving reporting quality of nonrandomized evaluations of behavioral and public health interventions: the TREND statement. *American Journal of Public Health* 2004;**94**(3):361—4.

Please cite this article in press as: Fahy K, et al. Holistic physiological care compared with active management of the third stage of labour for women at low risk of postpartum haemorrhage: A cohort study. *Women Birth* (2010), doi:10.1016/j.wombi.2010.02.003