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# Induction of Labor for Maternal Indications at a Perivable Gestational Age; Survey on Management, Reporting and Auditing amongst Dutch Maternal-Fetal Medicine Specialists and Neonatologists

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## Abstract

### Keywords

- ▶ termination of pregnancy
- ▶ legislation
- ▶ survey
- ▶ MFM specialists
- ▶ neonatologists

**Background** In cases of life-threatening maternal conditions in the perivable period, professionals may consider immediate delivery with fetal demise as a consequence of the treatment. We sought the opinion of involved medical professionals on management, reporting, and auditing in these cases.

**Methods** We performed an online survey amongst all registered maternal-fetal medicine (MFM) specialists and neonatologists in the Netherlands. The survey presented two hypothetical cases of severe early-onset pre-eclampsia at perivable gestational ages. Management consisted of immediate termination or expectant management directed towards newborn survival.

**Findings** In the case managed by immediate termination, 62% percent answered that fetal demise resulting from induction of labor for maternal indications should be audited only within the medical profession. In the case of expectant management, 17% of the participants agreed with this management. Some answers revealed a significant difference in opinion between the medical specialists.

**Conclusion** Perspective of MFM specialists and neonatologists differs with regard to counseling prospect parents in case of severe early onset pre-eclampsia. The majority of professionals is willing to report late termination (after 24 weeks' gestation) for severe maternal disease to medical experts for internal audits but not for legal auditing.

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Dutch legislation on termination of pregnancy has been in place since the 1981 and regulations on termination of pregnancy after 24 weeks' gestation, the so called 'late terminations', since 2007. In 2016 Dutch regulations for late termination of pregnancy have been revised by the Ministries of Justice and Health to promote reporting and auditing. This was preceded by a formal evaluation of the existing regulations and a debate amongst professionals. The current study was done in the framework of this debate.

In the Netherlands termination of pregnancy is subject to a number conditions, such as parental request and reflection time, exempted from legal prosecution up to the moment where the newborn is judged to be viable outside the womb. This is usually considered to be after 24<sup>0/7</sup> weeks of gestation for adequately grown fetuses with a sufficient amount of amniotic fluid for lung development and without life-threatening congenital disorders.<sup>1</sup>

Termination for nonmedical reasons is usually performed in licensed abortion clinics up to 22 weeks. Terminations for genetic reasons or medical maternal disorders are performed in obstetric units of secondary or tertiary care hospitals. In the Netherlands, approximately 30,000 pregnancies are terminated up to 24 weeks on an annual base. Half of these take place before 7 weeks' gestation and 3% after 21 weeks. Twelve percent of women undergoing termination of pregnancy are not residing in the Netherlands. There is an annual report of the Health Care Inspectorate in an aggregated form.<sup>2</sup>

In case of termination beyond 24 weeks, the procedure is the following: every death of a minor, including induced or spontaneous stillbirth after 24<sup>0/7</sup> weeks has to be reported to the Municipal Coroner who then reports to the District Attorney.<sup>3</sup> This also accounts for neonatal deaths on neonatal care units as well as fetal demise during labor and delivery. Up to the early 2016 the cases of termination were further subject to review by one of two expert committees.<sup>4</sup> In case of lethal-fetal disorders, the so-called category 1, a committee of the Dutch Society of Obstetrics and Gynecology performed an internal audit and reported anonymous and aggregated to the member gynecologists as well as to the Dutch Health Care Inspectorate. Category 2 pertained to cases with severe but not necessarily lethal disorders where neonatologists would refrain from senseless postnatal intervention. Cases in this category were audited by a committee appointed by the Ministries of Justice and Health<sup>4</sup> and reported on a case by case basis to the Attorney General, the highest legal authority in the Netherlands. As from the early 2016 both committees have been merged. The current committee consists of four medical specialists, one lawyer and one ethicist.<sup>5</sup>

Induction of labor for maternal indications at a perivable gestational age was noted in the former regulation but not extensively addressed. In the new regulation, cases of induction of labor for maternal indications do not have to be reported to the aforementioned committee. Annually, there are approximately 25 terminations of pregnancy for maternal indications in the Netherlands.<sup>6</sup> Approximately 12 of these take place at or shortly after 24 weeks. Up to now these cases were rarely reported to the District Attorney, because fetal demise was considered the inevitable consequence of the

treatment of the mother, and because of lack of clear guidelines. With our survey we aimed to help clarify the issues at stake. Also the results of this survey can be used to reopen the discussion amongst professionals and gain uniformity of registration and auditing in a newly developed registration system after introduction of the new regulations.

## Design and Methods

### Survey Design

All registered maternal-fetal medicine (MFM) specialists and neonatologists in the Netherlands were invited to participate in an online survey, using a commercial internet-based service (*surveymonkey.com*). Both disciplines are involved as well in patient counseling as in the evaluation of the regulations. We approached both disciplines separately. The survey invitation included a cover letter stating the study's objective, the voluntary and anonymous nature of the study, the intent to use the data in a publication, and contact information. By completing the survey, the participants consented to these terms. The ethical advisory board of the VU Medical Centre evaluated the survey and exempted the study from formal ethical review (VUmc 29–2010/200).<sup>7</sup>

The survey presented two hypothetical cases of severe preeclampsia in combination with dismal fetal prospects based on historical patient records. The cases are summarized in ►Figs. 1 and 2.

The survey questions were pretested by eight reviewers who were representative for the study population. The reviewers assessed clarity and content, order of questions, and total time needed to complete the survey. The final survey consisted of seven multiple answer questions. The four questions accompanying the first case were on reporting and auditing and the three questions accompanying the second case were on management. It took approximately 10 minutes to complete the survey.

### Survey Distribution

An invitation with a link to the survey was sent by an e-mail to all MFM specialists ( $n = 197$ ) and neonatologists ( $n = 282$ ) registered in the Netherlands either as a member of the Dutch Society of Obstetrics and Gynecology or the Pediatric Association of the Netherlands in 2015. Two months after the initial approach we sent a reminder. Four months after the first invitation, the survey was closed.

### Data Management

Results are presented as absolute numbers and percentages. Statistical analysis was performed with SPSS 20.0 (SPSS Inc., Chicago, IL). Differences were tested with a Fisher's exact test as appropriate.  $p$ -Values less than 0.05 were considered statistically significant.

## Results

The overall response rate was 37% (175), 34% amongst the MFM specialists ( $n = 66$ ) and 39% amongst the neonatologists ( $n = 109$ ).

**Case 1:**

A 20 year old primigravid woman is admitted to the hospital with preeclampsia at a gestational age of 24<sup>2/7</sup> weeks. She is treated with antihypertensive medication and magnesiumsulphate to prevent eclampsia. Fetal ultrasound shows signs of severe growth restriction (EFW 359 grams) and an abnormal flow profile in the umbilical artery. At a gestational age of 25 weeks her condition deteriorates and the decision is made to terminate the pregnancy in order to prevent worse maternal outcome. Because of the severe fetal growth restriction labor is induced with prostaglandins. No fetal monitoring is performed. She delivers a still born son with a birth weight of 412 grams. She makes a full recovery within one week.

**Questions\***

- Do you think this case should have been reported to the municipal coroner?
- Do you think such cases should be audited by either the professional society or by the district Attorney or by both or by neither?
- Are you willing to report such cases to the committee of The Dutch Society of Obstetrics and Gynecologists for an internal audit?
- Do you think such cases should be reported to an expert committee appointed by the ministries of Health and Justice?

**Fig. 1** Case 1: Possible answers consist of yes, no, I don't know, and a free text option.

Answers to questions on case 1 are shown in ► **Tables 1 and 2**. In this case, labor was induced for severe early-onset pre-eclampsia after a gestational age of 24 weeks with an estimated fetal weight (EFW) of 359 grams. Fetal demise was not reported to the Municipal Coroner (► **Fig. 1**).

Sixty-two percent of the participants believed that fetal demise as a result of induction of labor for maternal indications should be subject to auditing within the medical profession only and that it should never be subject to legal audit (► **Table 1**).

Fifty percent of the respondents argued that this case should have been reported to the Municipal Coroner. Furthermore, 73% of all participants would be willing to report cases of termination for maternal indications resulting in fetal demise to an expert committee of the Dutch Society of Obstetrics and Gynecology. Thirty-three percent of all participants would be willing to report these cases to an expert committee appointed by the Ministries of Health and Justice, advising the Attorney General whether or not to prosecute the MFM specialist (► **Table 2**).

Fourteen percent ( $n = 22$ ) of participants recorded specific reasons in the free text box for their hesitation to report induction of labor for severe early-onset pre-eclampsia at a perivable gestational age to the expert committee appointed by the Ministries of Justice and Health. The given answers were: there are no other treatment options for the mother besides

immediate delivery ( $n = 9$ ) and fear of legal judgment could delay appropriate care ( $n = 4$ ). Six respondents felt that a multidisciplinary consultation and consensus between the involved medical specialties prior to the decision to induce labor should be sufficient. Three participants feared legal prosecution.

Answers to questions on case 2 are shown in ► **Table 3**. In this case, the patient developed severe early onset pre-eclampsia at a gestational age of 23<sup>2/7</sup> weeks. During expectant management, she suffered multiple eclamptic seizures. At a gestational age of 25 weeks, a caesarean section was performed. The mother has residual symptoms; the baby girl did not survive (► **Fig. 2**).

Only 17% of the participants agreed with the chosen expectant management and most of these were neonatologists (► **Table 3**). Seventy-five percent of MFM specialist answered that an eclamptic seizure is always a reason to terminate the pregnancy. Thirty-three percent of participants stated that they would have delivered via caesarean section even prior to 25 weeks. Neonatologists were more in favor of a caesarean section than MFM specialists.

At the end of the survey there was a free text box for recommendations and remarks. Twenty-one neonatologists (19%) mentioned that the parents' wishes should be leading in the choice between induction of labor versus active management. Eighteen (27%) MFM specialists gave a remark of which 13 (20%) stated that the maternal condition should

**Case 2**

A 28-year-old, primigravid woman is admitted to the intensive care unit with preeclampsia at a gestational age of 23<sup>2/7</sup> weeks. She is treated with magnesiumsulphate to prevent eclampsia. To control her blood pressure three different types of antihypertensives are needed. The pregnancy is managed expectantly in order to reach a term where the fetus is considered viable. During this period of expectant management she suffers from two different episodes with eclamptic seizures. At 25 weeks' gestation a caesarean section is performed. She delivers a baby girl with a birth weight of 495 grams (< 2.3<sup>th</sup> percentile). The girl is admitted to the neonatal intensive care unit. After three days she dies from complications related to prematurity. The mother has still problems with concentration and has a mild afasia.

**Questions\***

- Do you agree with the chosen management to prolong the pregnancy to reach a viable term for the foetus?
- Do you think a pregnancy should be terminated immediately after an eclamptic seizure?
- In this case would you have performed a caesarean section before GA of 25 weeks?

**Fig. 2** Case 2: Possible answers consist of yes, no, I don't know, and a free text option.

**Table 1** (Case 1): Question: do you think these cases should be subject to audits? If yes, what kind of audit?

Profession	Peers only (%)	Legal only (%)	Both (%)	None (%)
MFM specialists	42 (67) <sup>a</sup>	–	11 (17) <sup>a</sup>	10 (16) <sup>a</sup>
Neonatologists	59 (60) <sup>a</sup>	3 (3) <sup>a</sup>	14 (14) <sup>a</sup>	23 (23) <sup>a</sup>
Total	101 (62)	3 (2)	25 (15)	34 (21)

Note: Numbers are presented as absolute numbers according to profession.

<sup>a</sup>percentages are shown as percentages within the profession.

be leading in the choice between immediate delivery versus expectant management. Only five MFM specialists shared the opinion with the neonatologists that the parents' wishes should be leading (8%).

**Discussion**

As part of an active debate on the procedures to be followed in case of late termination of pregnancy for maternal indications, this study interrogated the opinion of MFM specialists

**Table 2** Answers to the questions on case 1

Profession	Yes (%)	No (%)	Unknown (%)	p-Value
Question: Do you think this case should have been reported to the municipal coroner?				
MFM specialist	44 (70) <sup>a</sup>	19 (30) <sup>a</sup>	–	
Neonatologist	37 (37) <sup>a</sup>	49 (49) <sup>a</sup>	13 (13) <sup>a</sup>	
Total	81 (50)	68 (42)	13 (8)	0.0015
Would you be willing to report this case to an expert committee of the Dutch Society of Obstetrics and Gynecology for an internal audit?				
MFM specialist	51 (85) <sup>a</sup>	9 (15) <sup>a</sup>	–	
Neonatologist	63 (66) <sup>a</sup>	24 (25) <sup>a</sup>	9 (9) <sup>a</sup>	
Total	114 (73)	33 (21)	9 (6)	0.1067
Do you think such cases should be reported to an expert committee appointed by the Ministries of Health and Justice?				
MFM specialist	18 (30) <sup>a</sup>	35 (58) <sup>a</sup>	7 (12) <sup>a</sup>	
Neonatologist	32 (33) <sup>a</sup>	42 (44) <sup>a</sup>	22 (23) <sup>a</sup>	
Total	51 (33)	77 (49)	29 (18)	0.3579

Note: Numbers are presented as absolute numbers (%) according to profession.

<sup>a</sup>percentages are shown as percentages within the profession.



**Table 3** Answers to the questions on case 2

Profession	Yes (%)	No (%)	No answer (%)	p-Value
Question: Do you agree with the chosen management to prolong the pregnancy to reach a viable term for the fetus?				
MFM specialists	5 (8) <sup>a</sup>	50 (82) <sup>a</sup>	6 (10) <sup>a</sup>	
Neonatologists	21 (22) <sup>a</sup>	49 (52) <sup>a</sup>	25 (26) <sup>a</sup>	
Total	26 (17)	99 (63)	31 (20)	0.0042
Question: Do you think a pregnancy should be terminated immediately after an eclamptic seizure?				
MFM specialists	42 (75) <sup>a</sup>	12 (21) <sup>a</sup>	2 (4) <sup>a</sup>	
Neonatologists	36 (38) <sup>a</sup>	16 (17) <sup>a</sup>	43 (45) <sup>a</sup>	
Total	78 (52)	28 (18)	45 (30)	0.3808
Question: In this case would you have performed a caesarean section before GA of 25 weeks?				
MFM specialists	13 (23) <sup>a</sup>	38 (68) <sup>a</sup>	5 (9) <sup>a</sup>	
Neonatologists	37 (39) <sup>a</sup>	33 (35) <sup>a</sup>	25 (26) <sup>a</sup>	
Total	50 (33)	71 (47)	30 (20)	0.0029

Note: Numbers are presented as absolute numbers according to profession. <sup>a</sup>percentages are shown as percentages within the profession.

and neonatologists on management, reporting, and auditing of two exemplary cases. In general, immediate delivery is considered to be the only effective treatment for the mother in cases of severe maternal illness, such as severe early-onset pre-eclampsia.<sup>8</sup> Our survey indicates that the majority of Dutch MFM specialists and neonatologists agree to report late termination of pregnancy for maternal indications to a committee of medical experts for auditing purposes but not to the District Attorney who may recommend legal prosecution. This opinion is based on the thought that fear for legal prosecution could lead to postponing induction of labor, the only effective treatment, in this way putting the mother at an unacceptable risk for severe morbidity and mortality.<sup>8</sup> In the Netherlands, pre-eclampsia is still the leading cause of direct maternal mortality and twice as frequent as thromboembolism. In the United Kingdom, the reverse is true.<sup>9,10</sup>

We presented two cases to all Dutch MFM specialists and neonatologists. The first case presented a pre-eclamptic woman whose fetus was severely growth-restricted, the estimated fetal weight being 359 grams. Termination of pregnancy was judged necessary because of the maternal situation. No fetal monitoring was performed, nor was there willingness to perform a caesarean section, or active neonatal resuscitation. Caesarean sections at an extreme premature gestational age are associated with a high risk of maternal morbidity (23% after caesarean delivery vs. 3.5% after vaginal delivery)<sup>11</sup> and has increased risk for complications in subsequent pregnancies.<sup>12</sup>

Some answers revealed a significant difference in opinion between MFM specialists and neonatologists. The first concern of the MFM specialists is the health of the women. The first concern of the neonatologists is to achieve a gestational age as favorable as possible for the newborn. In case 2 this

difference in view is the most obvious. The MFM specialists were less inclined to prolong pregnancy and less willing to recommend a caesarean section at a periviable gestational age because of the possible risks for the mother's health. The neonatologists were more willing to prolong the pregnancy and recommend a caesarean section, in the hope to increase the chances for newborn survival. Dutch guidelines are in place to recommend whether or not to start active neonatal management in case of spontaneous extreme preterm birth for appropriate for gestational age infants. The latest guideline dating September 2010, recommends intubation and ventilation from 24 weeks onwards and cardiac resuscitation from 25 weeks onwards. Estimated fetal weight limits are not included.<sup>13</sup> The American Association of Pediatrics (AAP) has established policies regarding resuscitation at the limits of viability and advises to base management decisions on an assessment of the infant's medical condition, physiologic maturity, and probabilities of death and/or severe disability.<sup>14</sup> But they also state that as in any pregnancy, obstetric interventions should be undertaken only after a discussion with the family on individual risks and benefits of management options. Parents should be given the choice for palliative care alongside the option to attempt resuscitation.<sup>15</sup> In case of pre-eclampsia decisions to delay delivery may result in worsening of the maternal condition and fetal growth in a compromised environment. The AAP advises health care providers to consider these risks in the context of periviable gestational age and expected outcome for the neonate and discuss these risks with the parents.<sup>15</sup>

A limitation of this study is the response rate of 37% (34% of the MFM specialists and 39% of the neonatologists). We invited all registered MFM specialists as well as all registered neonatologists; however, not all registered MFM specialists and neonatologists are employed in tertiary centers where these women are treated. Unfamiliarity with these complicated issues might have caused the response rate of 37%. Strength of the study is that the survey was sent to the MFM specialists and neonatologists separately. Results show a marked difference in viewpoint on whether or not to prolong pregnancies or perform a caesarean section in these cases. These differences in viewpoints should be taken into account when discussing cases in a clinical setting.

## Conclusion

This study investigated the opinion of medical professionals on management, reporting, and auditing late termination of pregnancy for maternal indications at a periviable gestational age. The majority of MFM specialists and neonatologists would be willing to report these terminations to a medical expert committee for internal audit but not for legal assessment. We hope that the results of this study will be useful to open the discussion between professionals and promote transparency as well as a positive attitude toward reporting and auditing.

## Conflict of Interest

None.

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