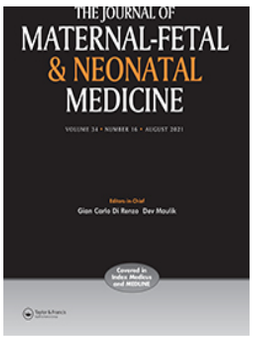

The Journal of Maternal-Fetal & Neonatal Medicine

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/ijmf20

Means of reaching successful antenatal transfers to level 3 hospitals in cases of threatened very preterm deliveries: a national survey

Kjell Helenius, Kaarin Mäkikallio, Antti Valpas & Liisa Lehtonen

To cite this article: Kjell Helenius, Kaarin Mäkikallio, Antti Valpas & Liisa Lehtonen (2021): Means of reaching successful antenatal transfers to level 3 hospitals in cases of threatened very preterm deliveries: a national survey, The Journal of Maternal-Fetal & Neonatal Medicine, DOI: 10.1080/14767058.2021.1922382

To link to this article: https://doi.org/10.1080/14767058.2021.1922382

THE JOURNAL OF MATERNAL-FETAL & NEONATAL MEDICINE
https://doi.org/10.1080/14767058.2021.1922382

Taylor & Francis
Taylor & Francis Group

SHORT REPORT

OPEN ACCESS Check for updates

Means of reaching successful antenatal transfers to level 3 hospitals in cases of threatened very preterm deliveries: a national survey

Kjell Helenius[a,b], Kaarin Mäkikallio[b,c], Antti Valpas[d] and Liisa Lehtonen[a,b]

[a]Department of Paediatrics and Adolescent Medicine, Turku University Hospital, Turku, Finland; [b]Department of Clinical Medicine, University of Turku, Turku, Finland; [c]Department of Obstetrics and Gynaecology, Turku University Hospital, Turku, Finland; [d]Department of Obstetrics and Gynaecology, Central Hospital of South Karelia, Lappeenranta, Finland

ABSTRACT

Introduction: Centralization of very preterm deliveries to level 3 hospitals is recommended to improve infant survival and prevent brain injury. We studied the clinical practices of centralization from level 2 to level 3 hospitals in cases of threatening very preterm delivery in Finland.

Materials and methods: Obstetricians in all 16 level 2 hospitals in Finland were invited to participate in an online survey regarding antenatal transfer to level 3 hospitals among women with threatened delivery below 32 gestational weeks. We report clinical thresholds used as indications and contraindications for antenatal transfers, and logistical factors related to transfers.

Results: Twelve out of 16 (75%) hospitals completed the survey. The lower gestational age threshold for antenatal transfer ranged from 22 + 0 to 23 + 0 weeks. All hospitals regarded preterm premature rupture of membranes, chorioamnionitis, and severe pre-eclampsia as indications for antenatal transfer to a level 3 hospital. Most hospitals reported transferring women in spite of regular contractions (interval over 5 min) or cervical dilatation up to 4 cm. Suspicion of placental abruption, abnormal cardiotocography tracing and poor maternal condition were the most frequently reported contraindications for antenatal transfer. The time to arrange antenatal transfer was less than 2 h in all hospitals, and overcrowding of level 3 hospitals rarely hindered antenatal transfer.

Conclusions: Successful centralization of very preterm deliveries is reached in Finland by rapid and active antenatal transfers. This study identified clinical thresholds used by obstetricians in a setting of long distances and high centralization rate.

Abbreviations: CTG: cardiotocography; PPROM: preterm premature rupture of membranes

ARTICLE HISTORY
Received 9 May 2020
Accepted 23 April 2021

KEYWORDS
Antenatal transfer; centralization; *in utero* transfer; preterm birth; preterm labor; very preterm delivery

Introduction

Survival and survival without severe brain injury of very preterm infants are significantly improved following delivery in level 3 hospitals, compared to lower level hospitals [1–3]. The identification of pregnant women needing antenatal transfer to a level 3 hospital is key for successful centralization. Relevant guidelines for antenatal transfers are usually empirical [4].

Identifying mothers that need to be transferred to tertiary care for threatened very preterm delivery is challenging, and includes evaluation of clinical signs such as cervical status and uterine activity, in conjunction with previous obstetrical history. Availability of tertiary care facilities and means of antenatal transfer influence the success of centralization [5].

Finland is sparsely populated, and distances between hospitals are long, from 15 to over 300 km. Prematurity rates and neonatal mortality rates are among the lowest in the world. Centralization of very preterm deliveries is highly successful in Finland, as in 2017, 95% of very preterm infants in Finland were delivered in level 3 hospitals [6]. The clinical decision-making behind the high rate of successful antenatal transfers is not known. With this survey, we studied antenatal transfer practices from level 2 hospitals to level 3 hospitals to gain knowledge about transfer thresholds used in clinical practice.

Materials and methods

We conducted a national survey in all level 2 hospitals in Finland from 11 November 2018 to 31 May 2019,

CONTACT Kjell Helenius kkhele@utu.fi Department of Paediatrics and Adolescent Medicine, Turku University Hospital, Kiinamyllynkatu 4-8, Turku 20521, Finland

Supplemental data for this article is available online at https://doi.org/10.1080/14767058.2021.1922382.

with survey questions focusing on indications, contraindications, and transfer-related logistical factors (Addendum) using the REDCap tools hosted at the University of Turku.

Results

The response rate was 75% (12/16 units) and included hospitals in all regions of the country. Based on the survey replies, level 2 obstetricians had high agreement regarding gestational age thresholds for antenatal transfer, with lower thresholds of 22 + 0 to 23 + 0 gestational weeks and upper thresholds of 31 + 6 (Addendum, Supplemental Table 1). Uniform replies were also noted regarding clinical indications for antenatal transfers including PPROM, chorioamnionitis, and severe pre-eclampsia in all hospitals. Clinical contraindications with high agreement included abnormal CTG tracing and placental abruption. Fetal fibronectin testing was not used in any of the hospitals.

The survey showed some variation regarding thresholds of clinical signs such as cervical length, cervical dilatation, and uterine contractions; however, the majority reported cervical dilatation of 5 cm or more and uterine contractions occurring at less than 5-min intervals as contraindications for antenatal transfer (Addendum, Supplemental Table 2).

All hospitals reported that logistical problems were rare, and that antenatal transfers on average were arranged successfully within 1–2 h from decision to dispatch from the referring hospital (Addendum, Supplemental Table 3). The most frequently encountered reason for unsuccessful transfers were imminent delivery and maternal or fetal distress.

Discussion

Our results suggest that active obstetrical referral attitudes and unobstructed transfer pathways enable centralization of very preterm deliveries, and that thresholds for necessary and safe transfers were quite uniform among Finnish level 2 obstetricians.

National Finnish guidelines recommend antenatal transfer to level 3 hospitals in cases of expected preterm delivery below 32 + 0 weeks of gestation or if the estimated birth weight is 1500 g or less [7]. These guidelines, however, do not specify thresholds for safe antenatal transfers. Our survey provides information about referral practices and delineates thresholds used in clinical practice. Obstetricians were uniform regarding gestational age thresholds for transfers both at the lower (22 + 0 to 23 + 0 weeks) and upper (31 + 6 weeks) limit. The upper limit for centralization is lower in some countries, although 32 weeks is also commonly applied [8–10].

Obstetricians were also quite uniform in their active approach to transfer even if the mother was in labor. The thresholds to withhold transfer were 5-min intervals regarding uterine contractions and 5 cm regarding cervical dilatation. This practice is supported by previous studies linking cervical dilatation and uterine contractions to timing of delivery [11].

Our survey indicated that Finnish obstetricians uniformly comply with the national recommendations for antenatal transfer. A recent study from the United Kingdom showed that by informing obstetricians of the benefits of antenatal transfer, the mean quarterly rate of extremely preterm infants born in level 3 hospitals increased from 49% to 78% [12]. Their results also indicated that level 2 obstetricians frequently were anxious about mothers delivering during transfer, even if no such cases occurred during the study, and previous studies indicate that delivery en route is extremely rare [13]. Currently, antenatal transfer guidelines tend to be based on empirical rather than scientific evidence. Therefore, our study provides valuable information on feasible, safe thresholds used by obstetricians in a setting with long inter-hospital distances. Our results also indicated rapid arrangement of transfers, a factor that has been problematic elsewhere [5].

Clinical indications for antenatal transfers included PPROM, chorioamnionitis, and severe pre-eclampsia in all hospitals. Clinical contraindications included abnormal CTG tracing and placental abruption. Antenatal transfer to level 3 hospitals of women with severe pre-eclampsia at very preterm gestations is recommended, but recommendations regarding antenatal transfer in cases of PPROM and chorioamnionitis are often not clearly stated [14,15].

A strength of this study is that we were able to include level 2 units from all five level 3 hospital regions, and encouraged participating hospitals to base the survey replies on group discussions to minimize the potential effect of individual preferences. Limitations include the lack of clinical data to confirm the findings. In addition, the survey was based on individual clinical signs as separate manifestations, which might not reflect real-life decisions.

Conclusions

This study showed that Finnish obstetricians actively facilitate antenatal transfers for women with

threatened very preterm delivery. With well-functioning logistics, an active approach to referrals creates the foundation for centralization of very preterm deliveries.

Acknowledgments

The authors wish to acknowledge obstetricians in all participating hospitals for their valuable input.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Kjell Helenius http://orcid.org/0000-0002-6296-6797

References

[1] Rautava L, Lehtonen L, Peltola M, et al. The effect of birth in secondary- or tertiary-level hospitals in Finland on mortality in very preterm infants: a birth-register study. Pediatrics. 2007;119(1):e257–e263.

[2] Lasswell SM, Barfield WD, Rochat RW, et al. Perinatal regionalization for very low-birth-weight and very preterm infants: a meta-analysis. JAMA. 2010;304(9):992–1000.

[3] Helenius K, Longford N, Lehtonen L, et al. Association between early postnatal transfer and birth outside a tertiary hospital with mortality and severe brain injury: a whole-population study of extremely preterm infants. BMJ. 2019;367:l5678.

[4] Management of acute in-utero transfers: a framework for practice. British Association of Perinatal Medicine; 2008; [Internet]; [cited 2020 Apr 16]. Available from: https://www.bapm.org/resources/27-management-of-acute-in-utero-transfers-a-framework-for-practice-2008

[5] Gale C, Hay A, Philipp C, et al. In-utero transfer is too difficult: results from a prospective study. Early Hum Dev. 2012;88(3):147–150.

[6] Helenius K, Gissler M, Lehtonen L. Trends in centralization of very preterm deliveries and neonatal survival in Finland in 1987–2017. Transl Pediatr. 2019;8(3):227–232.

[7] Käypä Hoito: Ennenaikainen synnytys [Current care guidelines: preterm birth]; 2019; [Internet]; [cited 2019 Nov 14]. Finnish. Available from: https://www.kaypahoito.fi/hoi50089#

[8] NHS Clinical Reference Group. E08/S/a. Neonatal critical care. Schedule 2—the services A. service specifications; 2019; [Internet]; [cited 2019 Mar 18]. Available from: https://www.england.nhs.uk/commissioning/spec-services/npc-crg/group-e/e08/

[9] van Reempts P, Gortner L, Milligan D, et al. Characteristics of neonatal units that care for very preterm infants in Europe: results from the MOSAIC Study. Pediatrics. 2007;120(4):e815–e825.

[10] Vård av extremt för tidigt födda barn [Care of infants born extremely preterm]. Socialstyrelsen; 2014. Swedish; [Internet]; [cited 2020 Apr 16]. Available from: www.socialstyrelsen.se

[11] How HY, Khoury JC, Sibai BM. Cervical dilatation on presentation for preterm labor and subsequent preterm birth. Am J Perinatol. 2009;26(1):1–6.

[12] Edwards K, Impey L. Extreme preterm birth in the right place: a quality improvement project. Arch Dis Child Fetal Neonatal Ed. 2020;105(4):445–444.

[13] Akl N, Coghlan EA, Nathan EA, et al. Aeromedical transfer of women at risk of preterm delivery in remote and rural Western Australia: why are there no births in flight? Aust N Z J Obstet Gynaecol. 2012;52(4):327–333.

[14] WHO. WHO recommendations for prevention and treatment of pre-eclampsia and eclampsia; [Internet]. World Health Organization; 2019; [cited 2019 Dec 2]. Available from: https://www.who.int/reproductive-health/publications/maternal_perinatal_health/9789241548335/en/

[15] Overview. Preterm labour and birth. Guidance. NICE; [cited 2019 Oct 14]. Available from: https://www.nice.org.uk/guidance/ng25