

Letter to the Editor

Intrapartum complications and new guidance on patient care

Dear Editor,

The issue of maternal intrapartum infections requires special attention, since if they are not diagnosed or not properly managed, they can give rise to major complications such as sepsis, maternal death or disability and increase the likelihood of early neonatal infection and other adverse outcomes. Sepsis has in fact been reported to determine a mortality risk ranging from 1.8% to 17.6% and increases to 28-33% in the case of septic shock^{1,2}.

It is necessary to take into account whether the pregnancy was natural or achieved through medically assisted procreation (MAP) techniques, in couples with fertility issues due to male and/or female factors³⁻⁵. In fact, in addition to the infectious risk to which each pregnancy is exposed both throughout gestation and in particular in the peripartum, MAP pregnancies may entail a higher risk of gestational hypertension and/or abnormalities of placental insertion for which specific therapies for preeclampsia and peripartum haemorrhage^{6,7} may be required. At any rate, regardless of the type of conception and the risks related to it, pregnancy is associated with a shift of the immune system from an inflammatory state that would contribute to the rejection of the fetus, towards an anti-inflammatory immunological state, which on the contrary fosters the passive transition of maternal antibodies to the fetus. However, pregnant women should not be considered immunosuppressed: their immune system is in fact biased towards an anti-inflammatory phenotype that influences both the outcome of pregnancy and the pathogenesis of some diseases. Such changes have been found to play a role in the maternal response to infections^{8,9}.

In genetically predisposed women there can be an abnormal activation of the pro-inflammatory mediator system with consequent hemodynamic alterations that can cause amniotic fluid embolism, a rare but serious obstetric emergency¹⁰.

In this regard, particular attention must be paid to the method of delivery and the possible risk of peripartum infections that follow¹¹⁻¹³. Today there is a growing demand for a more physiological birthing experience, such as through water birth. Although water immersion in the first stage of labor is generally considered to be a safe and cost-effective method of pain management in women in labor, many concerns remain about the safety of conducting the second stage of labor and the water birth as well, especially for neonatal risks and medico-legal implications¹⁴. Scientific research data^{15,16} have reported several serious adverse outcomes among infants born via waterbirth, including breathing problems (including the possibility of drowning in fresh water), rupture of the umbilical cord with bleeding, and water-borne infections. Cases of major infections with *Pseudomonas aeruginosa* and *Legionella pneumophila* have also been reported¹⁷. Another noteworthy condition linked to the peripartum infectious risk is the premature rupture of the membranes that can be associated with fluid getting tainted by meconium; such an outcome could make it necessary to expedite the delivery in order to minimize the adverse neonatal outcomes for which it is found in clinical practice to perform pressure maneuvers on the bottom of the uterus such as the Kristeller maneuver¹⁸⁻²⁰ with major complications including uterine rupture²¹ or using tools such as forceps²² and the kiwi sucker²³. In some cases, it is necessary to perform an episiotomy to facilitate the passage of the fetus through the birth canal, since at the end of the expulsive period there is a risk that

the perineum will tear during child's birth; a surgical cut can help to prevent this from happening, allowing better healing of the tissues. Currently available findings show that especially in the case of first childbirth, the risk of suffering serious injuries to the rectum and the *levator ani* muscles is higher in the case of traumatic laceration, although episiotomy is still a very controversial procedure²⁴.

In addition, in these cases it may be helpful to make a diagnosis of fetal position through intrapartum ultrasound, especially in nulliparous and in childbirth analgesia, also in order to reduce possible cases of malpractice and litigation²⁵⁻²⁷. In light of the high rates of litigation to which obstetricians and gynecologists are exposed^{28,29}, the need for clean-cut, broadly shared guidelines could greatly contribute to reducing malpractice lawsuits and mitigating the alarming push towards preventive medicine practices by obstetrics and gynecologist³⁰⁻³². Peripartum often requires decisions to be made in the very short term, hence a greater degree of objectivity and clarity in the decision-making process is of utmost importance to ensure that patients can benefit of evidence-based care grounded in solid scientific consensus. This way, professionals can act out of conscience without the fear of being held liable for their actions in case of adverse outcomes. The recently issued European guidelines on perinatal care go in that direction, as they address the already mentioned practice of episiotomy, a legally and clinically controversial procedure³³. Just as importantly, the patients' mental health during peripartum cannot be overlooked, as such a crucial aspect is likely to influence outcomes in a major way, as stressed by new guidelines issued last September by the World Health Organization (WHO)³⁴. Such legislative and regulatory adjustments aimed at a greater degree of harmonization are even more important now, as healthcare systems have been put under tremendous strain by the COVID-19 pandemic and further economic difficulties are likely to be in the offing. Optimizing the allocation of resources and helping professional uphold the patients' rights to timely and reliable healthcare will, therefore, be vital, as budget cuts put universal healthcare to the test, and more people lose their financial ability to pay healthcare costs due to the economic crisis.

Conflict of Interest

The Authors declare that they have no conflict of interests.

References

- 1) Dolea C, Stein C. Global burden of maternal sepsis in the year 2000. Evidence and Information for Policy, World Health Organization, Geneva, July 2003. Available at: http://www.who.int/healthinfo/statistics/bod_maternalsepsis.pdf. Accessed May 31, 2014.
- 2) Mabie WC, Barton JR, Sibai B. Septic shock in pregnancy. *Obstet Gynecol* 1997; 90: 553-561.
- 3) Goudakou M, Kalogeraki A, Matalliotakis I, Panagiotidis Y, Gullo G, Prapas Y. Cryptic sperm defects may be the cause for total fertilization failure in oocyte donor cycles. *Reprod Biomed Online* 2012; 24: 148-52.
- 4) Prapas Y, Petousis S, Panagiotidis Y, Gullo G, Kasapi L, Papadeothodorou A, Prapas N. Injection of embryo culture supernatant to the endometrial cavity does not affect outcomes in IVF/ICSI or oocyte donation cycles: a randomized clinical trial. *Eur J Obstet Gynecol Reprod Biol* 2012; 162: 169-173.
- 5) Rallo G, Negro F, Consalvo F, Piersanti V, Marinelli S. Medically assisted procreation in times of COVID-19: what impact on health care system organization and the reproductive rights of couples? *Acta Biomed* 2021; 92: e2021275.
- 6) Margioulou-Siarkou G, Margioulou-Siarkou C, Petousis S, Margaritis K, Vavoulidis E, Gullo G, Alexandratou M, Dinas K, Sotiriadis A, Mavromatidis G. The role of endoglin and its soluble form in pathogenesis of preeclampsia. *Mol Cell Biochem* 2022; 477: 479-491.
- 7) Privitera AA, Fiore M, Valenti G, Schiattarella A, Raniolo S, Riemma G. The role of serum potassium and sodium levels in the development of postpartum hemorrhage. A retrospective study. *Ital J Gynecol Obstetr* 2020; 32: 126.

- 8) Robinson DP, Klein SL. Pregnancy and pregnancy associated hormones alter immune responses and disease pathogenesis. *Horm Behav* 2012; 62: 263-271.
- 9) Abu-Raya B, Michalski C, Sadarangani M, Lavoie PM. Maternal Immunological Adaptation During Normal Pregnancy. *Front Immunol* 2020; 11: 575197.
- 10) Frati P, Foldes-Papp Z, Zaami S, Busardo FP. Amniotic fluid embolism: what level of scientific evidence can be drawn? A systematic review. *Curr Pharm Biotechnol* 2014; 14: 1157-1162.
- 11) Zaami S, Montanari Vergallo G, Napoletano S, Signore F, Marinelli E. The issue of delivery room infections in the Italian law. A brief comparative study with English and French jurisprudence. *J Matern Fetal Neonatal Med* 2018; 31: 223-227.
- 12) Wagner M, Falcone V, Neururer SB, Leitner H, Delmarko I, Kiss H, Berger A, Farr A. Perinatal and postpartum care during the COVID-19 pandemic: A nationwide cohort study. *Birth* 2022; 49: 243-252.
- 13) Marinelli E, Negro F, Varone MC, Trojano G, Del Rio A, Zaami S. Perinatal and post-partum infections in times of Coronavirus are compliance with cautionary measures and safety protocols key factors in staving off litigation. *Ital J Gynecol Obstetr* 2020; 32: 189.
- 14) Vidiri A, Zaami S, Straface G, Gullo G, Turrini I, Matarrese D, Signore F, Cavaliere AF, Perelli F, Marchi L. Waterbirth: current knowledge and medico-legal issues. *Acta Biomed* 2022; 93: e2022077.
- 15) Clews C, Church S, Ekberg M. Women and waterbirth: A systematic meta-synthesis of qualitative studies. *Women Birth* 2020; 33: 566-573.
- 16) Burns E, Feeley C, Hall PJ, Vanderlaan J. Systematic review and meta-analysis to examine intrapartum interventions, and maternal and neonatal outcomes following immersion in water during labour and waterbirth. *BMJ Open* 2022; 12: e056517.
- 17) Barton M, McKelvie B, Campigotto A, Mullowney T. Legionellosis following water birth in a hot tub in a Canadian neonate. *CMAJ* 2017; 189: E1311-E1313.
- 18) Malvasi A, Zaami S, Tinelli A, Trojano G, Montanari Vergallo G, Marinelli E. Kristeller maneuvers or fundal pressure and maternal/neonatal morbidity: obstetric and judicial literature review. *J Matern Fetal Neonatal Med* 2019; 32: 2598-2607.
- 19) Youssef A, Salsi G, Cataneo I, Pacella G, Azzarone C, Paganotto MC, Krsmanovic J, Montaguti E, Cariello L, Bellussi F, Rizzo N, Pilu G. Fundal pressure in second stage of labor (Kristeller maneuver) is associated with increased risk of levator ani muscle avulsion. *Ultrasound Obstet Gynecol* 2019; 53: 95-100.
- 20) Farrington E, Connolly M, Phung L, Wilson AN, Comrie-Thomson L, Bohren MA, Homer CSE, Vogel JP. The prevalence of uterine fundal pressure during the second stage of labour for women giving birth in health facilities: a systematic review and meta-analysis. *Reprod Health* 2021; 18: 98.
- 21) Zaami S, Malvasi A, Marinelli E. Fundal pressure: risk factors in uterine rupture. The issue of liability: complication or malpractice? *J Perinat Med* 2018; 46: 567-568.
- 22) Evanson SM, Riggs J. Forceps Delivery. 2022 Jul 17. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan. PMID: 30855808.
- 23) Siggelkow W, Schwarz N, Beckmann MW, Kehl S, Faschingbauer F, Schild RL. Comparison of Obstetric Efficacy and Safety of the Kiwi OmniCup with Conventional Vacuum Extraction. *Geburtshilfe Frauenheilkd* 2014; 74: 146-151.
- 24) Zaami S, Stark M, Beck R, Malvasi A, Marinelli E. Does episiotomy always equate violence in obstetrics? Routine and selective episiotomy in obstetric practice and legal questions. *Eur Rev Med Pharmacol Sci* 2019; 23: 1847-1854.
- 25) Beck R, Malvasi A, Kuczkowski KM, Marinelli E, Zaami S. Intrapartum sonography of fetal head in second stage of labor with neuraxial analgesia: a literature review and possible medicolegal aftermath. *Eur Rev Med Pharmacol Sci* 2019; 23: 3159-3166.
- 26) Gilboa Y, Perlman S. Intrapartum ultrasound for the management of the active pushing phase. *Am J Obstet Gynecol MFM* 2021; 3: 100422.
- 27) Malvasi A, Montanari Vergallo G, Tinelli A, Marinelli E. "Can the intrapartum ultrasonography reduce the legal liability in distocic labor and delivery?". *J Matern Fetal Neonatal Med* 2018; 31: 1108-1109.
- 28) Gowda SL, Bhandiwad A, Anupama NK. Litigations in Obstetric and Gynecological Practice: Can it be prevented? A Probability to Possibility. *J Obstet Gynaecol India* 2016; 66: 541-547.
- 29) Adinma J. Litigations and the Obstetrician in Clinical Practice. *Ann Med Health Sci Res* 2016; 6: 74-79.
- 30) Montanari Vergallo G, Zaami S. Guidelines and best practices: remarks on the Gelli-Bianco law. *Clin Ter* 2018; 169: e82-e85.
- 31) WHO recommendations: Intrapartum care for a positive childbirth experience. Geneva: World Health Organization; 2018. PMID: 30070803.
- 32) Malvasi A, Marinelli E, Ghi T, Zaami S. ISUOG Practice Guidelines for intrapartum ultrasound: application in obstetric practice and medicolegal issues. *Ultrasound Obstet Gynecol* 2019; 54: 421.

- 33) Laine K, Yli BM, Cole V, Schwarz C, Kwee A, Ayres-de-Campos D, Vayssiere C, Roth E, Gliozheni E, Savochkina Y, Ivanisevic M, Kalis V, Timonen S, Verspyck E, Anstaklis P, Beke A, Eriksen BH, Santo S, Kavsek G, Duvokot H, Dadak C. European guidelines on perinatal care- Peripartum care Episiotomy. *J Matern Fetal Neonatal Med.* 2021 Dec 12:1-6. doi: 10.1080/14767058.2021.2005022. Epub ahead of print.
- 34) WHO guide for integration of perinatal mental health in maternal and child health services 19 September 2022. Available at. <https://www.who.int/publications/i/item/9789240057142> (Accessed on 9th November 2022).

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