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Legal and ethical issues related to multifetal pregnancy reduction (MPR) in spontaneously conceived twin pregnancies: an interdisciplinary analysis based on a case study

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ABSTRACT

Following the uncertainty expressed by a group of healthcare professionals working in the gynaecology and obstetrics department of an Italian public hospital on how to proceed in the case of patients asking for a multifetal pregnancy reduction (MPR), the need to further investigate the topic led to the constitution of a working group devoted to discussing the topic through an interdisciplinary approach.
The purpose of this work is therefore to present the legal and ethical issues addressed through the analysis of: 1) the literature on the subject; 2) legislation, doctrine and case-law related to the foetal reduction procedure; 3) the ethical issues raised by the request and implementation of that procedure.
Although, under certain conditions, the legal and ethical legitimacy of this procedure can be sustained, we argue that there is a need for clarification with regard to the definition of the term and its links to existing legislation, as well as for the development of guidelines to assist health professionals.

INTRODUCTION

Multifetal pregnancy reduction (MPR) is a procedure that refers to the *in utero* termination of one or more foetuses in a multiple pregnancy, usually in the first (or early-second) trimester, while allowing the remaining of one or more of them to develop [1]. MPR can be performed using two different methods, namely, ultrasound-guided transvaginal embryo reduction (ER), which is performed between 6- and 8-weeks gestation, and ultrasound-guided transabdominal foetal reduction (FR), which is performed after 11 weeks gestation. Although these two procedures differ considerably, both in terms of their implementation and in terms of pregnancy outcomes [2], for the purposes of this contribution we will refer generally to MPR without specifying the method by which it is performed.

MPR dates back to the mid-1980s [3], when a number of specialised centres in the US and Europe began using it to decrease the risk of complications of higher-order multifetal pregnancies by reducing the number of foetuses. Although the use of MPR has dramatically increased with the spread of *in vitro* fertilization (IVF) [4], obviously not all multifetal pregnancies occur after the use of assisted reproductive technology and, therefore, a request for foetal reduction can also be made in the case of a pregnancy conceived spontaneously.

Yet, the biomedical literature, as well as the Italian legislation, seem to substantially ignore the possibility that a request for MPR is made when the pregnancy has been established without any use of assisted fertilisation techniques, leaving patients and health professionals in a condition of serious uncertainty as to the legally and ethically correct course of action to follow.

Moreover, the implementation of MPR due to woman's request, without maternal or foetal indications, in the first trimester of pregnancy, is not commonly performed in Italy.

This procedure raises several issues both from a legal standpoint, in particular regard to its possible areas of application and limits imposed by current legislation, and from an ethical point of view [5]. Specifically, from an ethical point of view, regardless of the possible moral issues linked to the pregnancy termination itself and, therefore, to the possible conscientious objection of health professionals, this procedure presents additional difficulties, especially related to the possibility and methods of choosing the foetus/foetuses to be reduced.

This contribution presents legal and ethical considerations developed with regard to the MPR procedure. In particular, although the Clinical Ethics Consultation Service was initially involved in order to analyse retrospectively the legal and ethical implications of a specific case in which it emerged that healthcare professionals were uncertain as to how to proceed, given the relevance of the issue, as well as the considerable uncertainties related to the interpretation of current legislation, an interdisciplinary working group was set up to deepen the topic both from a legal and ethical standpoint.

In particular, the working group sought to answer the following questions:

1. What is meant by MPR and what are the specific features of this procedure? Should MPR be considered a form of selective or non-selective termination?
2. On the basis of the definition identified, can this pregnancy termination be considered legally admissible under the current Italian regulatory framework? Are there any restrictions on this practice?
3. Starting from the elements that would differentiate abortion in a single pregnancy from the MPR, are there any ethical reasons for adopting different and/or additional criteria to determine the specific course of action that should be followed?

The purpose of this contribution is therefore to carefully outline the legal and ethical aspects related to this procedure, in order to provide health professionals who face this type of request with precise indication on how to proceed. To this end, a literature search was first conducted to identify a precise definition of the procedure and, above all, to highlight the differences between selective and non-selective termination; based on this definition, legal and jurisprudential references deemed relevant were identified; finally, the ethical issues raised by the possible implementation of an MPR were also identified and discussed.

CLINICAL CASE

A group of healthcare professionals working in the gynaecology and obstetrics department of an Italian public hospital asked the hospital's clinical ethics consultation service for clarifications on how to deal with MPR requests.

In particular, the intervention of the ethics consultation service was solicited following the case of a patient (a gravida 4, Para 3, 8th gestational week) who had requested the MPR of a spontaneously conceived pregnancy, for non-clinical reasons, but rather linked to her and her family's psycho-physical well-being.

CASE IN POINT DEFINITION: FOETAL REDUCTION AND SELECTIVE TERMINATION

The Italian Law no. 194 of 22 May 1978, on "Regulation on the maternity social protection and on voluntary termination of pregnancy", does not specifically discipline the MPR procedure. MPR is only mentioned in the Law no. 40 of 19 February 2004 on medical assisted reproduction, which, however, does not provide a clear definition of it.
For this reason, the definition of this procedure was search in the international medical literature, where the development interruption of one or more foetuses during a twin pregnancy is named differently depending on the condition and motivation that support it. Although there aren't specific definitions widely accepted, it is possible to distinguish two broad categories of partial termination of (multi) twin pregnancy, the selective termination and the non-selective foetal reduction.
What selective termination and non-selective foetal reduction have in common is that in both cases the development of one or more foetuses is interrupted *in utero* after pregnancy has already begun [6].
However, s*elective termination* is used to interrupt the development of one of the foetuses affected by a serious and incurable pathology [7-11] and in the case of less severe pathologies affecting the foetus, pathologies which could be prejudicial to the development of the healthy foetus or foetuses [12].
Foetal reduction is instead referring to the simple numerical reduction of the foetuses, all potentially/probably healthy, through the termination of one or more of them [6]. According to most authors, foetal reduction is carried out to minimize the *in utero* foetuses' mortality or to improve maternal medical outcomes by reducing the number of foetuses *in utero* to one, two or three in a high-rank multiple pregnancy (more than three foetuses) [3, 13-15]. According to some authors, this procedure can also be performed when a couple confronted with a twin or triplet pregnancy wishes to give birth to only one or two children for socio-economic reasons [15-18].
Foetal reduction is also defined as non-selective reduction [15], since the purpose of the procedure is the only numerical reduction of the foetuses while the selective termination aims to interrupt a specific foetus development affected by a malformation or a genetic disorder.
Selective termination procedure is usually performed in the second trimester when most genetic, structural, or developmental abnormalities can be identified by ultrasound examination or by an invasive procedure. Conversely, non-selective foetal reduction can be performed both early (6-8th gestational weeks) and late (11-14 weeks), but usually before 16th gestational weeks. Non-selective foetal reduction is optimally performed in late first trimester. This timeframe is best for two reasons: firstly, there is the increased likelihood of spontaneous miscarriage in the first trimester, which may render the procedure unnecessary; secondly, a detailed structural survey is possible during this window, to confirm that all embryos appear anatomically normal.
Based on these assumptions, we refer at this case in point as non-selective foetal reduction, usually simply named MPR in literature. Indeed, in this case the patient requested to act on one of the two randomly in order to switch from a twin pregnancy to a singleton.

LEGAL CONSIDERATIONS: FOETAL REDUCTION AND ITALIAN LAWS NO. 40/2004 AND NO. 194/1978

Considering the categories of partial termination of pregnancy contemplated by the international literature, the working group wondered if the procedure requested by the patient – defined as non-selective foetal reduction, or simply MPR – could be considered legally permissible in the current Italian regulatory framework.
As mentioned, Law no 194/78 does not specifically regulate the MPR procedure.
In the Italian legislation the only reference made to MPR is contained at comma 4, art. 14 of Law no. 40/2004, according to which: "For the purposes of this law on medically assisted reproduction, embryo reduction of multiple pregnancies is forbidden, except in cases provided for by Law no. 194 of 22 May 1978".
What can be derived from this juridic statement is that: 1) generally speaking, the legislator did

not impose an absolute prohibition on MPR, since it is clearly provided a derogation in specific circumstances ("except in cases provided for […]"); 2) MPR is possible in the event of multiple pregnancies conceived through IVF techniques, under conditions provided by Law no. 194/78.

The aforementioned law leads us to a first conclusion: we can claim that an argument for voluntary termination of pregnancy to be legally considered as such only in the event of a "total" pregnancy interruption, and not in the event of the termination of only one (or more) foetuses, must be considered invalid. Conversely, MPR is clearly provided as a legal possibility, although only when the conditions illustrated in Law no. 194/78 are met.

Moreover, it is important to note that the amendments introduced by the Constitutional Court of Italy to Law no. 40/2004 have watered down its original *ratio legis*, which was primarily aimed at protecting the embryo; in this perspective must be interpreted art. 14 of the aforementioned Law, which can be considered as a bridge between the existing regulations about IVF, and the possibility to perform MPR procedures provided for by Law no. 194/78.

Once pointed out that the legislator allows MPR in cases of IVF under certain conditions, it is necessary to ask ourselves: can MPR only be legally allowed for IVF multiple pregnancies, or can it be legally allowed in cases of spontaneously conceived multiple pregnancies?

Firstly, keeping in mind that women who choose IVF should be previously informed and therefore fully aware of the possibility (*rectius:* of the risk) of incurring in a multiple pregnancy, there would seem to be no reasons to believe that legislator willingly chose to allow MPR only for IVF induced pregnancies, while forbidding it altogether for natural multiple pregnancies.

Moreover, following doubts emerged in health professionals in the very first period of validity of Law no 40/2004 in relation to the termination of a twin pregnancy limited to only one of the two foetuses (in this case, affected by a genetic abnormality), even the jurisprudence on the subject (ex. Cagliari Tribunale, 5 June 2004 and 30 June 2004) considered the full operativity of the Law no.194/78 on termination of pregnancy even in case of multiple pregnancy naturally conceived. Despite the few references in the Italian jurisprudence to this subject, the aforementioned approach seems to be shared by some authors [19, 20].

For example, Chiessi, addressing a case of reduction in presence of foetal malformation, concluded that this procedure «does not raise new or different ethical issues when compared to those raised by the usual abortion procedure for a malformed foetus in case of single pregnancy» and that «having to meet more requirements for foetal reduction than for the voluntary termination of pregnancy […] could lead to unjustified differences within the voluntary pregnancy termination regulations». The same argument was also extended to cases in which the foetus/foetuses did not present any malformation. The author states: «similar to what happens with abortions, foetal reductions must be approached differently depending on whether it is carried out within or after 90 days from the pregnancy beginning, since the possibility to have an abortion in the first three months has little limitations, whereas after 90 days such a possibility is allowed only after the mandatory obstetric-gynaecologic evaluation of the hospital in which the procedure would be performed» [19].

In other words, just like in single pregnancies the proven presence of malformations or genetic anomalies in the foetus is not relevant for the purpose of requesting and executing an abortion in the first 90 days, in the same way this requirement should have no relevance in cases of MPR that happen in the same period.

There are, however, several doubts that must be clarified by the legislator. From a terminological point of view, for example, is not clear what is meant by embryonic reduction and whether, following what is stated in Law no. 194/78, the reduction could be performed even after the transition from embryo to foetus development (around 10 gestational weeks). Moreover, to clarify this ambiguity, it could be useful to provide an MPR specific legislation, as it was done by the Norwegian law (Norwegian Abortion Act) [21], which states that: «foetal reduction is meant as a procedure that would interrupt pregnancy for one or more foetuses in a multiple pregnancy, while the pregnancy continues for one or more of the other foetuses» (section 2.3 of the Abortion Act).

To summarise:

1. MPR is legally possible in case of IVF as provided for by Law no. 194/78 (ex. art 14 c.4 Law no. 40/04).
2. Based on the arguments presented, this possibility could also be considered applicable to naturally conceived multiple pregnancies, de-

spite the fact that the Italian legislation about abortion (which dates back to 1978) does not clearly mention multiple pregnancies nor does it distinguish between embryo and foetus.

3. The prohibition of foetal reduction provided for by art. 14 c.4 of Law no. 40/04 should therefore not be applicable in all cases where it is possible to interrupt a single pregnancy, particularly, whenever the circumstances provided for by the legislator in 1978 (art 4, 6 e 7 c.3) are met.

Regarding the requirements at the art. 4 of Law no. 194/78 it is important to note that over time the jurisprudence has widened the concept of woman's health, including in said concept the principle of protection of women's self-determination from being undermined**.** This evolution has important consequences even on the professional responsibilities of health professionals and institutions, in particular for what concerns damage compensation. Italy's Supreme Court of Cassation sentence (sec III 29/01/2018, n. 2070) recognized that, following an unwanted birth, the damage suffered by a woman is not only related to health, but also to the violation of her right to self-determination. The same sentence also stated that when the incorrect execution of an abortion procedure leads to an unwanted birth, the health-related damage derived from the violation of the right to self-determination should be recognized not only for the mother, but for the other parent as well. With a constitution-oriented reading of Law no. 194/78, the right to self-determination can be linked to a comprehensive vision of the right to health, seen as the physical and psychological well-being of the individual.

In conclusion, women that apply for MPR before the first 90 days of pregnancy can access the procedure when the requirements of art.4 of Law no. 194/78 are fulfilled (a serious danger to the physical or mental health of the woman, related to her health or economic, social, or family condition, or to the circumstances in which the conception occurred, or to predicted malformations of the embryo or foetus); after the first 90 days, it is possible to access MPR only in case of serious danger for the woman's life (ex art.6 lett. a) Law no.194/78). It should be noted that art. 6 provides for the possibility to access voluntary termination of pregnancy even if there are "documented pathologic processes, including those relating to anomalies or malformations of the unborn child, which can cause serious harm to the physical and mental health of the woman"; in this case, however, we would be in presence of a selective termination, a partial termination of multiple pregnancy that, as already pointed out, differs substantially from the MPR.

When the requirements provided for by Law no. 194/78 are not met, it is not possible to proceed with MPR; this prohibition, however, is not related to the requested abortion procedure (MPR), but to failing to meet the requirements needed to proceed with abortion *tout court*.

When such requirements are met, the refusal of a medical treatment that the law and regulations make possible would result in a criminal offence for health professionals (unless they appeal to article 9 of Law no.194/78 – conscientious objection), while proceeding with the abortion of both twins would be an overtreatment compared with was needed and/or requested.

ETHICAL ISSUES RELATED TO MPR

Based on the given MPR definition and on the juridical regulatory framework reconstruction that allow the recognition of the lawfulness of the procedure from the legal standpoint, the working group has individuated and discussed its ethical implications (we recall that the following ethical issues must be read in relation to MPR, therefore a non-selective procedure which does not consider the occurrence of foetal malformations/abnormalities).

Apart from moral considerations related to abortion procedures as a whole that naturally apply to MPR procedures as well, including the possibility of conscientious objection, we believe that MPR presents a higher number of challenges, precisely because of those elements that distinguish it from a single pregnancy termination (or a full pregnancy termination for a multiple pregnancy).

In this perspective, the following issues have emerged:

1) Social determinants, information, and woman's decision-making autonomy: psychological stress associated with multiple pregnancies and the choice to proceed with an MPR [22], as well as the abortion-related-stigma [23], are causes of concern not only in relation to woman's wellbeing, but also with regard to the influence they can have on woman's autonomy and competence in decision-making.

While, in fact, «the act of abortion alone does not increase the risk of having psychological problems», some social determinants - such as «low self-esteem, poor expectations of one's own cop-

ing, belonging to a culture or religion that prohibits abortion, low levels of anticipated social support, and perceived stigmatization and need for secrecy» [24] - can trigger anxiety and depression, which in turn can influence - and even impair - decision-making abilities. Therefore, recognising and seeking to protect the patient's psychological well-being by providing a safe and secure environment, adequate unbiased support, as well as complete and accurate information, is essential because it can help the patient to fully understand the information communicated and, consequently, enable her to reach a fully informed decision [25].

Indeed, in the case of MPR, the reasons for requesting this procedure (which is, as shown, non-selective and therefore not linked to possible foetal pathologies/malformations) are frequently associated with psychological and/or socio-economic issues [22]. Specifically, multiple pregnancies often result in «the need for additional childcare, greater household and medical expenditures, and the possibility that one of the parents will be unable to return to the workforce. There also are significant medical costs associated with multiple gestations. As compared with singletons, estimated health care expenditures are quadrupled for twins and are 10 times higher for triplets» [26]. These social, financial, and economic implications can increase the risk of severe parental stress and compromise their quality of life - to such an extent that higher divorce rates have been observed in parents of multiples [27]. Moreover, there also is an increased risk of maternal depression and child abuse in families raising multiples, particularly when one or more of the children has special needs [26].

In this perspective the doctor-patient relationship, decision-making support [24] and psychological counselling are therefore extremely relevant, all tools that must be made available to women who faces an abortion and, moreover, due to its specificity, MPR [26].

2) Potential risks for the mother and surviving foetus(es): existing literature does not identify any particular health risks for women undergoing the MPR procedure or for the surviving foetuses.

Specifically, as for maternal psychological health, no particular symptoms of depression or attachment problems emerge for women who had MPR compared to woman who had normal pregnancy [28], and some follow-up studies on psychological consequences related to this procedure do not report any negative effects, even though the importance of psychological support is recognized in couple who require MPR [22]. Although, as mentioned, multiple pregnancies can be highly stressful for couples, MPR seems to be psychologically well tolerated. According to some studies, sadness and guilt may persist for some time after MPR, especially if there are other particularly problematic conditions, but normal maternal bonding (and the achievement of parenthood goals), facilitate the resolution of grief and the large majority of couples overcome the trauma to preserve the lives of their living children [29].

As regards the psychophysical health of the surviving foetus(es), unlike single intrauterine death (sIUD) of a foetus in a monochorionic multiple pregnancy, which has profound consequences for the surviving twin, including a 30-50% risk of death or neurological damage (severe neurological injury was reported to be between 18% and 24% of monochorionic sIUD survivors) [30], MPR of dichorionic diamniotic twin pregnancy to singleton prevents preterm birth and low birth weight, without increasing the risk of miscarriages [31]. Evans, who studied the implications of MPR in the United States since the early 1980s, has found that a reduction of triplets to twins reduces the risk of miscarriage from 15% to 4%, from triplets to a singleton from 15% to 6% and from twins to a singleton from 8% to 3% [28].

Lastly, some of the arguments against MPR have focused on the remaining child's distress for growing up with the knowledge that he/she might have had a twin, but there are no empirical studies on long-term psychological effects for the remaining child following MPR, that can endorse this argument [28].

To date, we can therefore conclude that there are no significant risks of physical and/or psychological harm to women who undergo MPR, nor to surviving foetuses, either directly related to the intervention or subsequently.

3) Ethical considerations regarding the choice: the main difference between MPR and a full pregnancy termination (in both single and twin pregnancies) is the need to identify criteria to decide which foetus(es) to reduce.

Once again, it is important to underline that, for the purposes of this contribution, reference is made to criteria used for non-selective foetal reduction according to Italian law: limiting the analysis to non-selective foetal reduction implies taking into account only the case in which the foetuses are all healthy, thus excluding the possible presence of

malformations or clinical indications that might concern a particular foetus; limiting the analysis to the Italian legal system means on the other hand taking into account those criteria that would be feasible in the current Italian legal scenario.
Criteria identified in the following paragraphs are therefore those considered not only ethically justifiable, but also consistent with provisions of Law no. 194/78, whose rationale is to protect both women's health and maternity, and provisions of Law no. 40/2004, which in art. 13 letter b) prohibits "any form of selection for eugenic purposes of embryos and gametes" or interventions that do not pursue exclusively therapeutic and diagnostic purposes.

HOW TO CHOOSE? CLINICAL AND NON-CLINICAL CRITERIA

Clinical criterion

The criterion that was considered most satisfactory to identify the foetuses to be reduced is the technical accessibility of the foetus and position of the amniotic cavity in the uterus on ultrasound.
In the absence of anatomic features that would increase the risk of a potentially abnormal foetus, including large nuchal translucency, significant discrepancy in crown-rump length (smaller embryo), markers of aneuploidy (absent nasal bone, abnormal tricuspid and ductus venosus flow), the foetus most technically accessible and furthest away from the cervix should be selected for reduction.
The clinical criterion relating to the procedure can be used in line with provisions of Italian legal system since is based on two assets protected by Law 194/78: women's health and maternity. On the one hand, it causes the least possible danger/damage for women who undergoes the intervention; on the other hand, it protects the woman's desire to carry on pregnancy of one or more foetuses. Furthermore, by using the clinical criterion there is no risk of circumventing prohibition referred in art. 13 letter b) of Law 40/2004 which prohibits, in the context of IVF, any intervention aimed at selecting embryo based on genetic heritage (except in cases provided by law).

Randomized criterion

If no clinical reasons to prefer one foetus over another are present, the randomized criterion can be used.

To justify the ethical acceptability of this criterion, the following example is proposed as an analogy. Assume that there are two patients who need intensive care, but only one bed in the intensive care unit (ICU) is available. In this case, a broad body of literature argues that priority should be given to those who are most likely to survive and, assuming the same probability of survival, other proposed criteria are 1) life expectancy, 2) age, and 3) quality of life. However, if there were no significant differences between patients also in relation to these aspects, many authors believe that it would be appropriate to use so-called lottery or coin toss criteria, two randomized criteria that in this specific case led to the same outcome. Others believe that randomized criteria take priority over a) b) and c) which should not even be considered. The defense of randomized criterion is based on fact that this allows everyone to be treated identically and it has the virtue of not exacerbating pre-existing disadvantages and inequalities. In fact, in the presented example, both patients would have an equal opportunity to benefit from treatment and thus to survive.
Even in the case of MPR, whose aim is to reduce the number of foetuses because the mother feels she does not have the psycho-physical resources to carry a multiple pregnancy, it is possible to consider the request as a matter of allocation of scarce resources and consider the two foetuses as two patients competing for a bed in the ICU. In this scenario, given the equal probability of survival, life expectancy, age, and expected quality of life, the randomized criterion should be considered appropriate. Therefore, if it is not possible to use the clinical criterion, the randomized criterion could be used to identify the foetus to be reduced without making a selective choice. In fact, using other criteria, such as sex selection or selection against disability, would turn the case into a selective termination, which is not the subject of this reflection.

DISCUSSION

According to our findings, it is possible to argue that the request for an MPR can be accepted when the conditions established by Law no.194/78 are met. Consequently, women requesting an MRP in Italy should have timely access to appropriately regulated services.
The essential clinical prerequisites for delivering these interventions are detailed counselling, care-

ful choice of operative technique and appropriate gestational age. It is also recommended that MPR be provided only within a referral foetal medicine service, with expertise in foetal procedures, with an adequate case workload to maintain competence.
Moreover, since most of the excess perinatal morbidity and mortality associated with multiple gestations is directly related to the consequences of preterm birth but, to date, no effective interventions have been shown to prevent preterm delivery in twin pregnancy, current efforts should continue to focus on reducing the overall incidence of multiple pregnancies, with increasing priority for reducing the twin rate. To this end, several strategies are available to reduce the multiple gestation risk in infertility treatments. The most direct way to limit the risk of multiple gestation from ART is to transfer a single embryo, and strategies to improve live birth from single embryo transfer have primarily focused on maximizing embryo selection and endometrial synchrony. Strategies aimed at limiting the risk of multiple gestation in ovulation induction and ovarian stimulation treatments are also recommended. Conversely, in naturally conceived multiple gestation, the prevalence of dizygotic twinning varies with ethnicity, is associated with increased maternal age, greater parity, and a maternal family history of twinning, while the rate of monozygotic twins is relatively constant, although genetic predisposition may have some influence. Obviously, in these cases, all these risk factors are not amenable to change.
When dealing with complex medical procedures such as MPR, in addition to medical expertise, knowledge of the relevant ethical and legal implications is important.
MPR is a procedure that certainly has peculiar characteristics compared to the interruption of a single pregnancy (or the full interruption of a multiple pregnancy), as regards both the aspects relating to the definition of the case from the clinical point of view, its legal framework and, finally, the ethical issues which, independently of general considerations about the moral justification of abortion, are specifically linked to its implementation.
From a legal point of view, based on the analysis of national legislation, as well as of the doctrinal and jurisprudential production and evolution on the subject, it seems possible to conclude that MPR request can be accepted - both in the case of IVF, and of spontaneously conceived pregnancy -, if the conditions established by Law no. 194/78 are met. These include, especially in recent years, the woman's personal economic, social and family conditions, which, if they affect - and pose a serious danger to - her psychological and physical health, justify the request for and implementation of voluntary termination during the first 90 days of pregnancy. Moreover, also according to Law No. 194/78, the MPR can be requested (and carried out) even after the first 90 days if "pregnancy or childbirth involve a serious danger to woman's life" (ex art.6, l. a).
From an ethical point of view, the problem seems to be more complex, and mainly concerns the difficulty of choosing which foetus to reduce. The identified and described criteria, *i.e.*, the clinical criterion, which is considered preferable, and the randomized criterion, are those that not only can be considered ethically justifiable, but are also consistent with the provisions of current Italian legislation.
In fact, the working group's effort was to merge ethical considerations and normative indications, in order to identify criteria that may be useful to health professionals in deciding which course of action and method to adopt and through which procedures.

CONCLUSIONS

Although, based on the findings presented in this contribution, it can be argued that MPR is, under certain conditions, legally permissible, and although clinical and non-clinical criteria have been identified to address the ethical issues raised by the request for - and implementation of - this procedure, given the peculiarity and complexity of the issue, the authors conclude that a clarifying policy-makers intervention is desirable, as well as a broader reflection on the ethical issues raised is desirable.

COMPLIANCE WITH ETHICAL STANDARDS

Authors contribution

C.E., C.S., R.C., B.D., G.C., G.F., C.A., P.M.: Conceptualization, investigation, methodology, resources. C.E, C.S., B.D.: Writing - original draft, writing - review & editing. G.C., G.F., C.A., P.M.: Supervision, validation.

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REFERENCES

1. Sebghati M, Khalil A. Reduction of multiple pregnancy: Counselling and techniques. Best Pract Res Clin Obstet Gynaecol. 2021;70:112-22. doi: 10.1016/j.bpobgyn.2020.06.013.
2. Kim MS, Choi DH, Kwon H, Ahn E, Cho HY, Baek MJ, et al. Procedural and obstetric outcomes after embryo reduction vs fetal reduction in multifetal pregnancy. Ultrasound Obstet Gynecol. 2019;53(2):214-8. doi: 10.1002/uog.19024.
3. Dumez Y, Oury JF. Method for first trimester selective abortion in multiple pregnancy. Contrib Gynecol Obstet. 1986;15:50-3. Available at: https://pubmed.ncbi.nlm.nih.gov/3743080/.
4. Evans MI, Ciorica D, Britt DW. Do reduced multiples do better? Best Pract Res Clin Obstet Gynaecol. 2004;18(4):601-12. doi: 10.1016/j.bpobgyn.2004.04.019.
5. Evans MI, Fletcher JC, Zador IE, Newton BW, Quigg MH, Struyk CD. Selective first-trimester termination in octuplet and quadruplet pregnancies: clinical and ethical issues. Obstet Gynecol. 1988;71(3 Pt 1):289-96. Available at: https://pubmed.ncbi.nlm.nih.gov/3347412/.
6. Legendre CM, Moutel G, Drouin R, Favre R, Bouffard C. Differences between selective termination of pregnancy and fetal reduction in multiple pregnancy: a narrative review. Reprod Biomed Online. 2013;26(6):542-54. doi: 10.1016/j.rbmo.2013.02.004.
7. Del Río M, Martínez JM, Galindo A, Figueras F, Palacio M, Borrell A, et al. Successful selective termination at 17 weeks' gestation in monochorionic monoamniotic twin pregnancy affected by twin-twin transfusion syndrome and discordant for hypoplastic left heart syndrome. Prenat Diagn. 2005;25(13):1223-5. doi: 10.1002/pd.130.
8. Malone FD, Craigo SD, Chelmow D, D'Alton ME. Outcome of twin gestations complicated by a single anomalous fetus. Obstet Gynecol. 1996;88(1):1-5. doi: 10.1016/0029-7844(96)00112-3.
9. Paramasivam G, Wimalasundera R, Wiechec M, Zhang E, Saeed F, Kumar S. Radiofrequency ablation for selective reduction in complex monochorionic pregnancies. BJOG. 2010;117(10):1294-8. doi: 10.1111/j.1471-0528.2010.02624.x.
10. Rustico MA, Baietti MG, Coviello D, Orlandi E, Nicolini U. Managing twins discordant for fetal anomaly. Prenat Diagn. 2005;25(9):766-71. doi: 10.1002/pd.1260.
11. Beriwal S, Impey L, Ioannou C, Mrcog D. Multifetal pregnancy reduction and selective termination. Obstet Gynaecol. 2020;22(4):284-92. doi: 10.1111/tog.12690
12. Sepulveda W, Wong AE, Sandoval R, Aiello H, Otaño L. Monoamniotic twin pregnancy discordant for lethal open cranial defect: management dilemmas. Prenat Diagn. 2011;31(6):578-82. doi: 10.1002/pd.2751.
13. Mansour RT, Aboulghar MA, Serour GI, Sattar MA, Kamal A, Amin YM. Multifetal pregnancy reduction: modification of the technique and analysis of the outcome. Fertil Steril. 1999;71(2):380-4. doi: 10.1016/s0015-0282(98)00461-0.
14. Stone J, Ferrara L, Kamrath J, Getrajdman J, Berkowitz R, Moshier E, et al. Contemporary outcomes with the latest 1000 cases of multifetal pregnancy reduction (MPR). Am J Obstet Gynecol. 2008;199(4):406.e1-4. doi: 10.1016/j.ajog.2008.06.017.
15. Tadin I, Roje D, Banovic I, Karelovic D, Mimica M. Fetal reduction in multifetal pregnancy--eth-

ical dilemmas. Yonsei Med J. 2002;43(2):252-8. doi: 10.3349/ymj.2002.43.2.252.
16. Chervenak FA, McCullough LB, Wapner RJ. Selective termination to a singleton pregnancy is ethically justified. Ultrasound Obstet Gynecol. 1992 1;2(2):84-7. doi: 10.1046/j.1469-0705.1992.02020084.x.
17. Evans MI, Britt DW. Fetal reduction 2008. Curr Opin Obstet Gynecol. 2008;20(4):386-93. doi: 10.1097/GCO.0b013e3283079b93.
18. Stone J, Belogolovkin V, Matho A, Berkowitz RL, Moshier E, Eddleman K. Evolving trends in 2000 cases of multifetal pregnancy reduction: a single-center experience. Am J Obstet Gynecol. 2007;197(4):394.e1-4. doi: 10.1016/j.ajog.2007.06.056.
19. Chiessi S. Fetoriduzione selettiva in gravidanze gemellari o multiple. Il punto di vista giuridico. In: Funghi P, Giunta F, Paonessa C (eds), Medicina, Bioetica e Diritto. I problemi e la loro dimensione normativa. 2012. ETS Edizioni, pp 129-33.
20. Aprile A. Interruzione volontaria della gravidanza: casistica medico-legale. In: Canestrari S, Ferrando G, Mazzoni CM, Rodotà S, Zatti P 8eds), Trattato di Biodiritto. Il governo del corpo. 2011. Giuffré, pp 1719-34.
21. Lov om svangerskapsavbrudd [abortloven] - Lovdata. 1975. Available at: https://lovdata.no/dokument/NL/lov/1975-06-13-50. Accessed on July 27, 2022.
22. Bergh C, Möller A, Nilsson L, Wikland M. Obstetric outcome and psychological follow-up of pregnancies after embryo reduction. Hum Reprod. 1999;14(8):2170-5. doi: 10.1093/humrep/14.8.2170.
23. Hanschmidt F, Linde K, Hilbert A, Riedel-Heller SG, Kersting A. Abortion Stigma: A Systematic Review. Perspect Sex Reprod Health. 2016;48(4):169-77. doi: 10.1363/48e8516.
24. Upadhyay UD, Cockrill K, Freedman LR. Informing abortion counseling: an examination of evidence-based practices used in emotional care for other stigmatized and sensitive health issues. Patient Educ Couns. 2010;81(3):415-21. doi: 10.1016/j.pec.2010.08.026.
25. Cheong MA, Tay SK. Application of legal principles and medical ethics: multifetal pregnancy and fetal reduction. Singapore Med J. 2014;55(6):298-301. doi: 10.11622/smedj.2014077.
26. Committee Opinion No. 719: Multifetal Pregnancy Reduction. Obstet Gynecol. 2017;130(3):e158-e163. doi: 10.1097/AOG.0000000000002302.
27. Jena AB, Goldman DP, Joyce G. Association between the birth of twins and parental divorce. Obstet Gynecol. 2011;117(4):892-7. doi: 10.1097/AOG.0b013e3182102adf.
28. Dahl SL, Vaksdal RH, Barra M, Gamlund E, Solberg CT. Abortion and multifetal pregnancy reduction: An ethical comparison. Etikk i praksis - Nord J Appl Ethics. 2021;13(1):51-73. doi: 10.5324/eip.v15i1.3980.
29. Schreiner-Engel P, Walther VN, Mindes J, Lynch L, Berkowitz RL. First-trimester multifetal pregnancy reduction: acute and persistent psychologic reactions. Am J Obstet Gynecol. 1995;172(2 Pt 1):541-7. doi: 10.1016/0002-9378(95)90570-7.
30. O'Donoghue K, Rutherford MA, Engineer N, Wimalasundera RC, Cowan FM, Fisk NM. Transfusional fetal complications after single intrauterine death in monochorionic multiple pregnancy are reduced but not prevented by vascular occlusion. BJOG. 2009;116(6):804-12. doi: 10.1111/j.1471-0528.2009.02128.x.
31. Jin B, Huang Q, Ji M, Yu Z, Shu J. Perinatal outcomes in dichorionic diamniotic twins with multifetal pregnancy reduction versus expectant management: A systematic review and meta-analysis. Medicine (Baltimore). 2020;99(25):e20730. doi: 10.1097/MD.0000000000002073.