ORIGINAL ARTICLE



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Medical abortion via telemedicine for women and adolescents: Experience from Moldova

Correspondence

Rodica Comendant, Reproductive Health Training Center, 13/2 Mircea cel Batran Blvd, MD2044 Chisinau, Moldova. Email: cidsr2012@gmail.com

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Abstract

Introduction: To pilot and evaluate the safety and participant satisfaction of the first-ever telemedicine medical abortion service provided in Moldova, a lower-income country located in Eastern Europe.

Methods: Before enrolment, each participant confirmed their pregnancy with a urine pregnancy test, ultrasound and/or blood test and calculated the gestational age based on the last menstrual period. After study consent was obtained, the study clinician confirmed eligibility for medical abortion and the study and provided counselling via videoconference or telephone. Eligible participants received medications by mail or prescription. A follow-up call to assess abortion outcome, adverse events and other medical history was conducted 1 week after participants took mifepristone. A pregnancy test was taken 4 weeks after taking mifepristone for a final evaluation of the abortion outcome. The analysis was descriptive.

Results: Between March 2020 and March 2021, 549 eligibility screenings were conducted, and 531 study packages containing medications or prescriptions were sent to pregnant women and adolescents with gestations ≤ 9 weeks since the last menstrual period. The majority of procedures (n = 477, 89.8%) were completed without an in-person visit. Final abortion outcome was available for 499/531 (94.0%) medical abortion procedures: 484/499 (97.0%) were complete abortions, 11 (2.2%) were surgical completions (seven incomplete abortions and four continuing pregnancies), and four participants (0.8%) decided to keep their pregnancy. One serious adverse event occurred. Acceptability of the service was high (99.0% very satisfied or satisfied) and 86.5% of participants reported a future preference for telemedicine. The most commonly reported reasons for choosing the telemedicine service were convenience (n = 286, 56.2%) and confidentiality (n = 202, 39.7%).

Conclusion: The medical abortion via telemedicine service has proven to be a safe and acceptable option for women and adolescents in Moldova. This model has the potential to increase access to abortion, including during emergencies like the COVID-19 pandemic.

KEYWORDS

medical abortion, self-managed, telehealth, telemedicine, termination of pregnancy

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¹Reproductive Health Training Center, Chisinau, Moldova

²Department of Obstetrics and Gynecology, "Nicolae Testemitanu" State University of Medicine and Pharmacy of the Republic of Moldova, Chisinau, Moldova

³Gynuity Health Projects, New York, New York, USA

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INTRODUCTION

Moldova is a small, landlocked country situated between Romania and Ukraine. The right to abortion on request in Moldova has been legally protected since the country's independence in 1991, following the collapse of the Soviet Union. The legal age of consent for abortion is 16 years or older. Though initially of relatively poor quality, abortion has become increasingly safe in Moldova. Not a single death resulting from an abortion procedure has been recorded in the country since 2009. Improvements in the quality of abortion care are largely attributed to the growing availability of safe World Health Organisation (WHO)recommended abortion methods, such as medical abortion,² which was approved and incorporated in the Moldovan national safe abortion standards in 2004.

In 2014, a product approved by stringent regulatory authorities called Medabon containing copackaged mifepristone and misoprostol was registered in the country, thus assuring the quality of available abortion drugs. The medications can be obtained from most pharmacies with a prescription. The procedure, mifepristone and misoprostol are an out-of-pocket cost and are not covered by Moldova's national health insurance.

To obtain a medical abortion, the Moldovan national safe abortion standards state that patients are not required to have an ultrasound or laboratory tests; however, they are required to receive in-person counselling from a licensed gynaecologist and return to the clinic 2 weeks after taking medications to confirm abortion outcome. The requirement of two in-person visits creates difficulties for patients due to travel expenses, lost wages, childcare expenses, privacy and emotional burdens and scheduling conflicts.³ These difficulties are particularly felt by women and adolescents living in rural areas, who must travel to district hospitals to see a gynaecologist.

According to WHO recommendations, if patients have access to accurate information and a healthcare provider (should assistance be wanted or needed), medical abortion can be self-managed in the first trimester.⁴ For assessing medical abortion outcome, follow-up via telephone or video call combined with urine pregnancy testing is a feasible alternative to an in-person visit. 5,6 The remote delivery of clinical services using telecommunications technology, like telephone and video, is widely referred to as telemedicine. Moreover, a growing body of evidence demonstrates that medical abortion via telemedicine is just as safe and effective as standard in-person care. 7-9 Where telemedicine medical abortion is available, it tends to be the preferred option by patients.9-11

While medical abortion via telemedicine services have been developed and studied in several high-income countries, they are less documented in lower-middleincome countries like Moldova. Medical abortion is already routinely offered to patients seeking an abortion in Moldova, and internet coverage in Moldova ranks among the best in the world, with around 90% of the population

Practitioner Points

Telemedicine medical abortion should continue to be provided in Moldova as a possible alternative to in-person abortion care.

enjoying superfast internet access. 12 As part of implementing the first-ever telemedicine medical abortion service in Moldova, we piloted the service and collected data on its safety and participant satisfaction.

MATERIALS AND METHODS

The prospective observational pilot study was conducted from March 2020 until March 2021 at two participating sites in Moldova, the Reproductive Health Training Center (RHTC) in the capital city, Chisinau, and the Women's Health Center 'ANA' in Drochia, which is located in northern Moldova and serves rural communities. The study protocol was reviewed and approved by the National Committee for Ethics in Clinical Trial Expertise of the Ministry of Health of the Republic of Moldova on 30 October 2019 (Reference no. 754). We registered the study on www.clinicaltrials.gov (NCT04316325).

Multiple mechanisms were used to raise awareness about the telemedicine medical abortion service, including the creation of a website (www.avort.md/prin teleme dicina), advertising on social media, Google and online health portals, outreach to providers and distribution of print materials. Study sites informed people contacting them for abortion appointments about the service and how to access additional details via the website. The website included an interactive questionnaire which allowed participants to self-assess eligibility for medical abortion and indicate interest in participating in the study, provide contact information and preferred method of communication (phone, videoconference). Once the questionnaire was completed, only the participant's contact information was saved on RHTC's servers. Study staff contacted participants who expressed interest in the study, provided additional information about the study procedures, and confirmed participant's eligibility for the study. If participants wished to continue participation in the study, study staff sent participants informed consent forms to be signed electronically using REDCap electronic data capture tools (version 9.1.23) hosted at RHTC.¹³

Participants were eligible to participate in the study if they were 16 years of age or older, confirmed their pregnancy with a urine pregnancy test, ultrasound exam and/or blood test, had a gestational age of ≤63 days based on last menstrual period (LMP), reported no history of contraindications to medical abortion (intrauterine device in place, confirmed or suspected ectopic pregnancy based

on medical history, chronic adrenal failure, long-term corticosteroid therapy, known coagulopathy or anticoagulant therapy, severe anaemia or inherited porphyria, or allergy to mifepristone or misoprostol), and felt it was their personal decision to have an abortion. Ineligible participants were referred for in-person care.

After obtaining electronic study consent, study clinicians contacted participants to confirm eligibility for medical abortion and the study, provide counselling and collect demographic and medical information. Study staff sent participants detailed step-by-step instructions via email or messaging platform (Viber or WhatsApp) describing how to use abortion medications, expected symptoms and side effects, scheduled follow-up and emergency procedures.

Study participants obtained abortion medications at a pharmacy with a digital image of a prescription or received them through standard postal delivery. Delivery was guaranteed by the national postal service anywhere in the country within 3 days. All participants were prescribed or sent Medabon combi-pack, which contains one tablet of 200 mg mifepristone and four tablets of 200 mcg misoprostol. In line with national safe abortion standards in Moldova, the medical abortion regimen used for participants with a gestational age <50 days LMP was 200 mg mifepristone followed by 400 mcg misoprostol sublingually 24-48 h later. 14,15 Participants with a gestational age between 50 and 63 days were instructed to ingest 200 mg mifepristone followed by 800 mcg misoprostol sublingually 24-48 h later. Participants with a gestational age between 56 and 63 days based on LMP were also sent a prescription for additional four 200 mcg misoprostol tablets. 14,15 Study clinicians instructed participants to take an additional dose of misoprostol if the participant (1) experienced bleeding less than regular menstrual period or if no bleeding occurred, (2) did not observe expulsion of products of conception, or (3) experienced persistent pregnancy symptoms. Participants were also instructed to contact the study clinician if symptoms indicated the need for a second dose of misoprostol or for any other reason.

One week after the scheduled mifepristone administration date, study clinicians contacted participants by phone or videoconference to review their experience with medical abortion, assess abortion completion, learn whether inperson care was sought and record adverse events. If further care was needed but could be managed remotely, the study clinician offered participants advice and prescribed any necessary medications. If participants required in-person care, study clinicians referred them to an appropriate facility. Participants took a home urine pregnancy test 4 weeks after mifepristone ingestion if they had not had a surgical intervention or ultrasound confirming abortion outcome, or if their menstrual period had not already begun.

The study clinician conducted a satisfaction survey after confirming final abortion outcome during the 4-week follow-up call or sooner if the participant was likely to be lost to follow-up. Participants rated their level of satisfaction

TABLE 1 Characteristics of study participants $(n = 509)^a$

| TABLE 1 Characteristics of study participants $(n = 509)^n$ | | |
|---|------------|--|
| Characteristic | % (n) | |
| Geographic location | | |
| Urban | 67.0 (341) | |
| Rural | 33.0 (168) | |
| Highest level of education completed | | |
| Less than highschool | 26.5 (135) | |
| Highschool | 26.5 (135) | |
| More than highschool | 47.0 (239) | |
| Age | | |
| 16–19 | 10.2 (52) | |
| 20–34 | 67.8 (345) | |
| 35–44 | 22.0 (112) | |
| Number of previous live births | | |
| 0 | 26.7 (136) | |
| 1 | 27.3 (139) | |
| ≥2 | 46.0 (234) | |
| Number of previous surgical abortions | | |
| 0 | 78.2 (398) | |
| 1 | 15.1 (77) | |
| ≥2 | 6.7 (34) | |
| Number of previous medical abortions | | |
| 0 | 79.2 (403) | |
| 1 | 18.5 (94) | |
| ≥2 | 2.3 (12) | |
| Gestation (days) | | |
| ≤49 | 81.3 (414) | |
| 50-55 | 9.8 (50) | |
| 56–63 | 8.9 (45) | |

^aExcludes 22 repeat abortions; for participants who accessed the service more than once, only the first procedure was included.

with the telemedicine service and a remote provider, expressed future preference for abortion in person or via telemedicine, and communicated their willingness to recommend the telemedicine service to a friend in need of abortion. Additionally, participants were asked to estimate the cost of the medical abortion service had it been in person, including transportation, childcare and lost wages. Cost savings were determined by calculating the percent change between participant's actual expenditures for the telemedicine medical abortion service and the estimated cost of in-person medial abortion service.

Study data were entered by study clinicians into a central study database using REDCap, ¹³ monitored by the study coordinator, and analysed using Excel software. The

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| Outcome | % (n) |
|---|------------|
| Medical abortion procedure completed without an in- person visit | 89.8 (477) |
| Decided to continue the pregnancy | 0.8 (4) |
| Dropped out of study | 0.2 (1) |
| In-person visit, abortion complete, no intervention needed | 1.3 (7) |
| In-person visit, MVA for incomplete abortion | 1.3 (7) |
| In-person visit, MVA for ongoing pregnancy | 0.8 (4) |
| Final abortion outcome unknown | 5.8 (31) |

Abbreviation: MVA, manual vacuum aspiration.

TABLE 3 Satisfaction of medical abortion via telemedicine $(n = 503)^a$

| | ` ′ |
|-------------------------------------|------------|
| Characteristic | % (n) |
| Satisfaction with service | |
| Very satisfied | 81.7 (411) |
| Satisfied | 17.3 (87) |
| Neutral | 1.0 (5) |
| Satisfaction with remote provider | |
| Very satisfied | 86.9 (437) |
| Satisfied | 12.3 (62) |
| Neutral | 0.6 (3) |
| Dissatisfied | 0.2 (1) |
| Future preference | |
| Telemedicine | 86.5 (435) |
| No preference | 10.3 (52) |
| In-person | 3.2 (16) |
| Would recommend service to a friend | |
| Yes | 92.2 (464) |
| Maybe | 5.8 (29) |
| No | 2.0 (10) |
| | |

^aIncludes multiple abortions by the same individual.

data analysis was descriptive. Since several participants enroled in the study more than once, our unit of analysis was the individual for the data on participant characteristics (Table 1). For abortion outcomes, number of in-person visits, and satisfaction data, we used each medical abortion procedure as the unit of analysis (Tables 2 and 3). Serious adverse events were defined as haemorrhage or infection requiring hospitalisation, transfusion, major surgery or death. Surgical intervention was defined as manual vacuum aspiration (MVA) performed to resolve continuing pregnancy or incomplete abortion.

To pilot the service, we initially planned to enrol 200 participants over 12 months based on previous firsttrimester service delivery statistics at each study site and funding considerations. Given higher than anticipated demand and additional financial support to RHTC from the donor, we were able to offer the service to 531 participants in total.

RESULTS

Between March 2020 and March 2021, 549 eligibility screenings were conducted (Figure 1), including 22 with participants who accessed the procedure for more than one unwanted pregnancy. Most participants learned about the study from the study website (n = 272, 53.4%), social networks (n = 143, 28.0%) and clinic staff (n = 77, 15.1%), while the rest were referred by other providers, friends/ acquaintances or local media outlets. Of the 549 screenings conducted, 8 did not meet eligibility criteria, and 10 decided not to participate. Thus, 531 telemedicine consultations were conducted (Figure 1). The majority of participants cited convenience (n = 286, 56.2%) as a reason for interest in the telemedicine medical abortion service, while other frequently cited reasons included confidentiality (n = 202, 39.7%), avoiding possible COVID-19 exposure and COVID-19 restrictions (n = 106, 20.8%), inability to find childcare (n = 79, 15.5%), and cost (n = 41, 8.0%, multiple responses permitted).

Study participants were representative of diverse geographic locations, educational backgrounds and age ranges (Table 1). Most participants were identified as living in urban areas (n = 341, 67.0%), though there were notable differences between the two study sites. The primary study site based in the capital city predominately enrolled urban dwellers (n = 318, 70.1%), while the majority of participants from the secondary site in the north were from rural areas (n = 36, 61.0%). The educational level of participants also varied by study site, with participants enroled by the primary site reporting higher educational attainment; 220 (48.9%) primary site participants and 19 (32.2%) secondary site participants completed more than highschool, respectively. The median age of participants was 28 years (interquartile range: 23-33). Fifty-four participants (10.2%) were adolescents aged 16-19.

Participants were also diverse in terms of their gestational age at the time of study enrolment and previous experience with pregnancy and abortion (Table 1). The median gestational age was 42 days (interquartile range: 36-49). Most participants had a gestational age ≤49 days (n = 414, 81.3%), while the rest of the participants had a gestational age between 50 and 63 days. A little over a fourth of participants (n = 136, 26.7%) never gave birth, while the rest of the participants gave birth at least once. About onefifth of participants had a previous medical abortion (n = 106, 20.8%) and a slightly greater number of participants had a previous surgical abortion (n = 111, 21.8%).

^aIncludes multiple abortions by the same individual.

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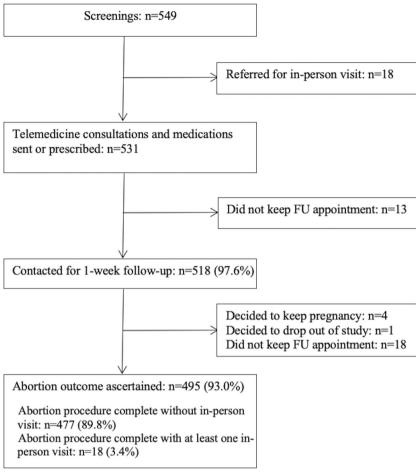


FIGURE 1 Flow of study participants

For the majority of procedures, the medications were sent by mail (n = 504, 94.9%) and the rest were obtained with a digital image of a prescription from a pharmacy. One week after the telemedicine medical abortion consultation, we were able to obtain outcome information from 518/531 (97.6%) procedures. For most procedures (n = 513, 99.0%), participants ingested mifepristone followed by misoprostol sublingually 24-48 h later, three (0.6%) ingested mifepristone only, and two (0.4%) did not ingest either of the two medications. Among participants that did not ingest both mifepristone and misoprostol, four decided to continue their pregnancy and one reported a complete expulsion of products of pregnancy after taking mifepristone only, without taking misoprostol. One participant reported taking both medications but decided to drop out of the study during the follow-up consultation 1 week after taking mifepristone for unknown reasons. In 13 instances (2.4%), participants were unresponsive to the study clinician's calls/messages.

Four weeks after mifepristone administration, we were unable to reach participants in 18 (3.4%) instances, but for all of these instances, providers were able to speak with the participants about their experience with the medical abortion at the 1-week follow-up. For all 18 procedures, at the 1-week follow-up, participants thought they passed the pregnancy and

none of them reported persisting pregnancy symptoms. None required in-person care leading up to the 1-week follow-up.

At the 4-week follow-up, the vast majority of procedures (n = 477, 89.8%) were completed without an in-person visit (Table 2). In total, 18 (3.6%) in-person visits were sought at healthcare facilities: in 11 instances, a surgical intervention was needed to complete the abortion; for three, additional misoprostol was provided for incomplete abortion; for two, additional counselling was provided but no reported medical treatment was performed; for one, antibiotics and analgesics for abdominal pain and fever were prescribed; and for one procedure, etamsylate and oxytocin for bleeding were provided. Of the 11 surgical interventions, one (0.2%) was a serious adverse event. After taking 200 mg mifepristone and 400 mcg misoprostol 24-48 h later, the participant had severe bleeding, was prescribed additional 400 mcg misoprostol, and was referred by her study clinician to a nearby clinic. The participant refused to obtain in-person care and the bleeding continued until her relative solicited emergency medical services for her. The participant was hospitalised, had an ultrasound confirming incomplete abortion, underwent surgical evacuation of uterine contents and received a blood transfusion for severe anaemia (haemoglobin of 6 g/dl), likely resulting from blood loss.

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For the majority of procedures (n = 498, 99.0%), participants reported feeling very satisfied or satisfied with the procedure (Table 3). In most instances, participants (n = 435, 86.5%) indicated that they would prefer remote care via telemedicine if they needed an abortion again in the future and 92.2% (n = 464) said that they would recommend telemedicine to a friend in need of an abortion. The most valued characteristics of the telemedicine service were convenience (n = 399, 79.3%), confidentiality (n = 188,37.4%), not having to seek childcare (n = 70, 13.9%), cost savings (n = 66, 13.1%) and avoiding possible COVID-19 exposure (n = 50, 9.9%, multiple responses permitted). The most disliked characteristic of the service was not having the consultations in person with a provider (n = 4, 0.8%). The average participant-perceived cost savings compared to an in-person procedure was 52%.

DISCUSSION

We found medical abortion via telemedicine up to 9 weeks' gestation to be a safe and highly acceptable service model for women and adolescents in Moldova with considerable perceived cost savings. In our telemedicine medical abortion study, the proportion of complete abortion without a surgical intervention (97.0%) was similar to the findings of in-person medical abortion studies reported in the literature, including medical abortion studies conducted at our study site. 16-19 The percentage of serious adverse events (0.2%) was similar to that observed among 18 435 telemedicine medical abortions provided in Great Britain and 1390 telemedicine medical abortions provided in the United States. 10,20 Most suspected incomplete abortions were resolved remotely with additional misoprostol and did not require an in-person visit. Participant-reported satisfaction and future preference for telemedicine were high, corresponding with acceptability outcomes of medical abortion via telemedicine service models in high-income countries.8-11

Our study provides support for continuing this model of care in Moldova. The medical abortion via telemedicine service was launched at the end of March 2020, a few weeks after the first COVID-19 cases were identified in Moldova and a week after the Moldovan government instituted a state of emergency. However, preparations for the service's launch began in October 2019, before the WHO declared the novel coronavirus (COVID-19) outbreak a global pandemic.²¹ Thus, though not explicitly designed in response to the COVID-19 pandemic, medical abortion via telemedicine served to address lockdown restrictions and fears of exposure associated with the pandemic, cited by 20.8% of participants as a reason for choosing the service. The majority of participants cited other reasons for selecting telemedicine, most notably convenience (56.2%) and confidentiality (39.7%). These findings demonstrate the service's applicability beyond the COVID-19 context, which the Ministry of Health of Moldova has acknowledged. In

August 2020, the Ministry of Health included medical abortion via telemedicine in the country's national safe abortion standards. Moldova is the first country in the Eastern Europe and Central Asia region to document medical abortion via telemedicine and integrate the service in its national safe abortion standards.

One of the challenges encountered in the provision of medical abortion via telemedicine was the infrequent acceptance of a digital image of prescriptions by pharmacies. Before the study start, we consulted with a few different pharmacies and were under the impression that an image of a prescription would be accepted elsewhere. All participants that accessed medications with a digital image of a prescription did so in the initial months following the launch of the service. After recognising that most pharmacies refused to accept digital prescriptions, study clinicians stopped writing them and began sending all medications and prescriptions for additional misoprostol via mail. Though the use of a digital prescription would help to reduce the workload on staff, we do not foresee them being accepted by pharmacies until a national electronic prescription programme is initiated.

The study represented approximately 10.6% of the total number of first-trimester abortions provided in Moldova in 2020. In terms of age, study participants were slightly more representative of younger age groups than observed in national-level abortion statistics. For example, while 10.2% of study participants were adolescents, 6.1% of abortions in 2020 were among this segment of the population. The age group 20–34 years was overrepresented in the study by 2.9% compared to data from 2020, while the age group 35 years and over was underrepresented by 7.0%, respectively. 22

The main limitation of this study is that the service was intended to reach a greater proportion of women and adolescents living in rural areas. In Moldova, 57.2% of the population is reported to live in rural areas, yet rural women and adolescents made up 33.5% of the study sample.²³ We attribute this difference to large levels of enrolment by the primary study site, which is the most populous urban centre in the country. In addition, many women work in larger towns and cities, which the 'catch-all' binary of urban and rural does not adequately capture. Since the secondary site was a much smaller urban centre, the proportion of enroled participants cited as living in rural areas (61.3%) was much closer to population-level figures. Further efforts should be made to raise awareness among rural populations about the service and additional sites outside of the capital city should be identified to better meet the needs of rural women and adolescents.

We were unable to ascertain the final abortion outcome of participants lost to follow-up (5.8%). While it is possible that these participants sought care at healthcare facilities, throughout our experience providing in-person medical abortion, those who do not return for a follow-up visit generally have a successful outcome. In addition, in 18/31 instances, we were able to speak with participants during their 1-week follow-up call, and at the time of this contact,

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all participants reported seeing expulsion of products of conception as well as discontinuation of pregnancy symptoms.

Another limitation was the self-reported nature of the cost savings analysis, requiring participants to estimate the amount an in-person medical abortion would have cost. To develop a more accurate understanding of the amount patients save when accessing medical abortion via telemedicine compared to accessing the service in person, a more rigorous analysis using actual costs associated with transportation, childcare and lost wages is needed.

CONCLUSION

The medical abortion via telemedicine service in Moldova is a promising model for abortion care both during and beyond the COVID-19 pandemic. The model is demonstrated to be safe, acceptable and potentially cost saving.

AUTHOR CONTRIBUTIONS

All authors contributed to the design of the study. Rodica Comendant, Stelian Hodorogea, Irina Sagaidac and Cristina Bubulici were responsible for the data collection. Clayborne Cook monitored the data collection and analysed the data. All authors interpreted the results. Rodica Comendant and Clayborne Cook wrote the first draft of the manuscript, and Ingrida Platais critically revised it. All authors approved the final manuscript.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in Harvard Dataverse at doi:10.7910/DVN/P8LDAK.

ETHICS STATEMENT

The study was approved by the National Committee for Ethics in Clinical Trial Expertise of the Ministry of Health of the Republic of Moldova on 30.10.2019 (Reference no. 754). The authors registered the study on http://www.clinicaltrials.gov (NCT04316325).

ORCID

Rodica Comendant https://orcid.org/0000-0002-2806-4183

Clayborne Cook https://orcid.org/0000-0002-6338-1926
Stelian Hodorogea https://orcid.org/0000-0002-5717-8382

Irina Sagaidac https://orcid.org/0000-0003-2491-9612
Cristina Bubulici https://orcid.org/0000-0003-1326-1798
Ingrida Platais https://orcid.org/0000-0001-5609-5393

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