Myths and misconceptions about emergency contraception pills

Pavlek, Paula

UNIVERSITY OF ZAGREB

SCHOOL OF MEDICINE

Paula Pavlek

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Abbreviations and their explanations

BMI – body mass index

EC – emergency contraception

ECPs – emergency contraception pills

EE – ethinyl estradiol

FDA – Food and Drug Administration

IUD – intrauterine device

LH – luteinizing hormone

LNG-EC – levonorgestrel emergency contraception

SPRM - selective progesterone receptor modulator

STD – sexually transmitted disease

UPA – ulipristal acetate

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Summary

Emergency contraception is a method of contraception used after sexual intercourse. It is used in case of unprotected sexual intercourse, in case of improper use or accident with an already existing method of contraception (condom slippage/rupture, diaphragm displacement, forgotten oral contraception) or in the case of sexual abuse. This method of contraception has been proven to be very effective in preventing unwanted and unplanned pregnancies that are still present in large number in today's world and mainly end in abortion. The Yuzpe method is the first developed method of emergency oral contraception. Today, in most countries, it has been replaced by more effective methods that have less frequent and milder side effects. These methods include levonorgestrel emergency contraception pill and ulipristal acetate emergency contraception pill. The main mechanism of action of emergency contraception pills is delay of ovulation. If ovulation has already occurred, the methods are not effective and have no effect on an existing pregnancy. With the introduction of emergency contraception pill, many myths and misconceptions related to it have emerged. One of the leading myths is that emergency contraception pill is the same as the abortive pill, which the very mode of action of emergency oral contraception refutes. Women believe that after the use of emergency oral contraception, they do not have to be additionally protected until the end of the menstrual cycle, and that emergency contraception pill is effective in 100% of cases. They also believe that emergency oral contraception has long-lasting consequences and causes infertility. They believe that their acute side effects are very severe in the form of nausea and vomiting. One of the misconceptions is that emergency oral contraception is dispensed on prescription in all countries of the world. They also believe that emergency oral contraception is ineffective in obese women. All these myths have been countered by scientific facts and evidence. The media play a major role in spreading similar misconceptions.

Key words: emergency oral contraception, myths, misconceptions, media

Sažetak

Hitna kontracepcija jest metoda kontracepcije koja se koristi nakon seksualnog odnosa. Primjenjuje se u slučaju nezaštićenog spolnog odnosa, kod nepravilne primjene ili nezgode s već postojećom metodom kontracepcije (skliznuće/puknuće prezervativa, pomaknuće dijafragme, zaboravljena oralna kontracepcija) ili u slučaju seksualnog zlostavljanja. Ova metoda kontracepcije dokazala se vrlo djelotvornom u sprječavanju neželjenih i neplaniranih trudnoća koje su u današnjem svijetu i dalje prisutne u velikom broju, a većim dijelom završavaju pobačajem. Yuzpe metoda jest prva razvijena metoda hitne oralne kontracepcije. Danas je u većini zemalja zamijenjena učinkovitijim metodama koje imaju rjeđe i laganije nuspojave. Te metode uključuju levonorgestrel oralnu hormonsku kontracepciju te ulipristal acetat oralnu hormonsku kontracepciju. Glavni način djelovanja hitne oralne kontracepcije jest odgoda ovulacije. Ako je ovulacije već nastupila, metoda nisu djelotvorne te nemaju utjecaj na već postojeću trudnoću. Pri uvođenju hitne oralne kontracepcije, pojavili su se mnogi mitovi i zablude vezani za istu. Jedan od vodećih mitova jest da je hitna oralna kontracepcija isto što i abortivna pilula, što sam način djelovanja hitne oralne kontracepcije opovrgava. Žene vjeruju kako se nakon primjene hitne oralne kontracepcije ne moraju dodatno štiti do kraja menstrualnog ciklusa te kako je hitna oralna kontracepcija djelotvorna u 100% slučajeva. Također vjeruju kako hitna oralna kontracepcija ostavlja dugotrajne posljedice i uzrokuje neplodnost. Smatraju kako su akutne nuspojave istih vrlo teške, u vidu mučnina i povraćanja. Jedna od zabluda jest da se hitna oralna kontracepcija u svim zemljama svijeta izdaje na recept. Također vjeruju kako je hitna oralna kontracepcija nedjelotvorna kod pretilih žena. Svi navedeni mitovi opovrgnuti su znanstvenim činjenicama i dokazima. Mediji igraju glavnu ulogu u širenju sličnih zabluda.

Ključne riječi: hitna oralna kontracepcija, mitovi, zablude, mediji

1. EMERGENCY CONTRACEPTION – INTRODUCTION

Emergency contraception (EC) is a form of contraception taken after an unsafe or partially safe intercourse. It gives women a chance to prevent pregnancy not only after an unprotected intercourse, but also after an intercourse with faulty protection, such as preservative breakage or slippage, irregularly taken oral contraceptive, slippage of diaphragm and similar malfunctions of contraception (1,2). Emergency contraception is used after a sexual assault as well. Commonly used terms such as “postcoital contraception” and “morning-after pill” can be confusing so it is advised not to use them (2). Unwanted or unintended pregnancies are a major problem in today’s health system. They create a massive burden on the health care, women’s health and economy. This form of contraception has the ability to prevent a high percentage (up to 95%) of unwanted pregnancies after an inadequately protected intercourse (3). It is a highly time-sensitive method, meaning its efficacy is better if the contraceptive is taken as soon as possible after the intercourse (4). Emergency contraception is safe to use but it is important to mention that it cannot replace regular contraceptive methods and it should not be used as the first choice of contraception (5). It is assumed that incorporation of this method into the health care system could diminish abortion rate by 1 million less per year and reduce unwanted pregnancies rate by 2 million less per year in the United States (6). There are a few methods of emergency contraception, but this paper will mainly focus on oral contraceptives. The main discussion of this graduate thesis are the biggest myths and misconceptions in relation to emergency contraceptive pills.

2. UNINTENDED PREGNANCY

Unintended pregnancies are defined as pregnancies that were not planned or wanted, as well as untimed at the time of conception. As such, they represent one of the biggest burdens on health care services (7). They occur in all socioeconomic classes but the rate is proven to be somewhat higher in poor population and in women with low income (8).

According to World Health Organization reports in 2005, around 210 million pregnancies happen in the world every year. Out of 210 million, 87 million are stated to be unplanned and 41 million are carried out until the end of the pregnancy. In 2008, the total number of risky abortions was around 21-22 million worldwide while around 47 thousand maternal deaths were reported in the same year. It is a worrying fact that the rate of illegal and, therefore, unsafe abortions is on the rise. In developing countries around 19 million women, and around 15 million women in Asia have underwent unsafe abortion; there is an approximation saying around 500 thousand women die annually worldwide as a consequence of an unsafe abortion (8).

High mortality was not the only problem found with unwanted pregnancies. There are reports on children born from unintended pregnancies showing higher rates of felonious behavior during teenage and adolescent years. Moreover, higher rates of psychological problems were noticed in that group of children, such as anxiety and depression (8).

From the economic perspective, unintended pregnancies are extremely expensive, especially if we take into account that they are preventable and avoidable. A study performed in the United States estimated the cost of unintended pregnancies to be around $4.5 billion, 53% of those were due to poor adherence to contraceptives. By increasing

adherence and knowledge or by switching 10% of women aged 20-29 to long-acting reversible contraception, the costs would decrease by $288 million per year (9).

Lower education, lower conduct and depression are factors more often associated with higher rates of induced abortion. These women do not use emergency contraception as much as women with higher education even though they are thought to be at higher risk of unwanted pregnancy. A longitudinal study conducted in 2007 confirmed that women with typical risks for abortion use emergency contraception, while those with higher risk are not as frequent users (10). This just proves the importance of education and targeting specific, high risk groups. Not necessarily collage/university education, but also better accessibility to necessary information, easily reachable to public such as mass media.

All of the reasons mentioned above verify the importance of contraceptives in general, including emergency contraceptive methods. Widespread availability and accessibility are of crucial importance in reducing unintended pregnancies and their consequences on economy, later development of children, women's' health and mortality rates.

3. TYPES OF EMERGENCY CONTRACEPTION

Methods for emergency contraception are available as tablets and a device. While there is a small variety of pills for emergency contraception, there is only one device – copper intrauterine device. The main focus of this paper are pills, but since copper intrauterine device is proven to be the most effective type of emergency contraception, it will be briefly mentioned (11).

3.1. EMERGENCY CONTRACEPTIVE PILLS

When it comes to emergency contraceptive pills (ECPs), their main mechanism of action is delaying the ovulation. Fertilization can occur during the so-called *fertile period* or *fertile window;* a period of six days – five days prior to ovulation and the day of ovulation (12). Emergency contraceptive pills do not work after fertilization took place, so it is important to take them as soon as possible after an inadequately protected intercourse. There are a few options of emergency contraceptive pills. They are namely Yuzpe regimen, levonorgestrel only method and ulipristal acetate (13).

3.1.1. YUZPE METHOD FOR EMERGENCY CONTRACEPTION

General information

Yuzpe method or Yuzpe regimen is the oldest version of oral emergency contraception, first described and proposed by Yuzpe in 1974 (14).

Composition and dosage.

This oral contraceptive pill is a combination of 200 mcg of ethinyl estradiol (EE) together with 2.0 mg of DL-norgestrel (14), divided in two separate doses. Administration should not start later than 72 hours after intercourse. Second dose is taken 12 hours after the first one (15).

Mechanism of action

Giving this combination of estrogen and progestin in the first half of the menstrual cycle will delay or inhibit ovulation. Some studies propose there might be other effects of this method such as disrupted luteal function, changes in environment of the endometrium, reduced levels of sex steroid hormones, changes in cervical mucus and inhibition of fertilization (13).

Efficacy

Together with being the oldest, this method of emergency contraception is proven to be the least effective of all the options, but it still remains somewhat in use due to its accessibility to women. As all the other methods, Yuzpe method is most effective if taken as soon as possible; no later than 72 hours after an unsafe intercourse (13). Efficacy of Yuzpe method greatly depends on the size of the follicle. A study from 2002 proved this limitation of Yuzpe method. During this study, the size of the follicles was measured at the time of the treatment. In majority of participants, ovulation was postponed when follicles were in the range of 12 – 17 mm. Once follicles grew larger than 18 mm (18 – 20 mm), the treatment was unsuccessful (16). Based on eight different studies, a range of 56.4% to 89.3% effectiveness was established for Yuzpe method (17); very low compared to other emergency contraception pills.

Side effects

Nausea, vomiting, tiredness and dizziness are recurrently common side effects reported with this method. Many studies compared incidence of side effects with Yuzpe regimen and levonorgestrel. Frequency of these side effects was significantly higher in Yuzpe method

(18). Together with high failure rates and higher frequency of side effects being described, this method was successfully superseded with levonorgestrel and, eventually, ulipristal acetate as the drug of choice for emergency contraception (19).

Availability

Yuzpe regimen is sold in Croatia under the brand name “Cilest”. It is not approved as an emergency oral contraceptive by The Agency for Medicinal Products and Medical Devices (HALMED), rather it is approved only as hormonal contraceptive (20).

3.1.2. LEVONORGESTREL-ONLY CONTRACEPTIVE PILLS

General information

Levonorgestrel emergency contraception (LNG-EC) or, publicly better-known name Plan B, was first approved by Food and Drug Administration (FDA) in 1999 (21), and since then it gradually replaced Yuzpe method.

Composition and dosage.

Levonorgestrel is a synthetic and biologically active progestogen with a half-life of 43 hours (2,22).

This oral emergency contraceptive can be given as a single dose or divided into two doses. If it is divided into two doses, one dose consists of 0.75 mg of levonorgestrel, giving a total of 1.5 mg. First dose should be taken within 72 hours after the intercourse, followed by another dose 12 hours later (22).

If it is given as a single dose, it consists of 1.5 mg of levonorgestrel (23). There is no proven difference in efficacy of those two regimens (22).

Mechanism of action

Luteinizing hormone (LH) is an important factor in the process of ovulation. LH surge (substantial increase in LH concentration) is essential for ovulation to take place. Some studies have indicated levonorgestrel targets this LH surge and delays it, consequently postponing the ovulation too. For this system to be correct, it is necessary to take levonorgestrel before the LH surge has occurred. Variety of studies indicate ineffectiveness of levonorgestrel once LH surge or fertilization have happened (13). For an oral emergency contraceptive pill to be effective even after an LH surge has taken place, it has to be able to weaken sperm motility or quality by impairing cervical mucus. Other mechanism of action would be delay in follicular rupture. There are no evidence stating that LNG has any of these abilities which significantly reduces the period in menstrual cycle in which LNG can be effective (24).

Efficacy

Failure rates of this method are around 1.1%, which verifies this method as a very effective one. Certainly, these rates are after a correct application of the drug (25). After 72 hours of administration, the efficacy of levonorgestrel EC significantly drops so it is of crucial importance to take this pill as soon as possible after an unprotected intercourse (23).

Side effects

Side effects related to this type of emergency contraception are very rare and, usually, mild. Most common reported side effects are nausea, vomiting, diarrhea, headache, changes in frequency and amount of menstrual bleeding, breast tenderness and tiredness. There have been reports of severe side effects of this drug such as ectopic pregnancy, weight gain,

convulsions, infections and suicidal ideation. No significant difference in side effects has been noted between two dosage regimens for this drug (26,27).

Availability

Levonorgestrel emergency contraception is available worldwide. In Croatia, once it was introduced, it was a prescription drug. Since 2015, this drug is available without prescription and over-the-counter for everyone over the age of 16. Its cost is not covered by the Croatian health insurance (28).

In European Union and in Croatia, levonorgestrel is registered for use as emergency contraception in dosage of 1.5 mg under the brand name Escapelle® and Vikela® (2).

3.1.3. ULIPRISTAL EMERGENCY CONTRACEPTIVE PILLS

General information

Nowadays, ulipristal acetate is recommended as a first line option for emergency contraception. It was approved by the European Medicine Agency in 2009 and by the Food and Drug Administration in 2010. In 2012, it was not available in India (29). It also goes under a better-known name – Ella.

Composition and dosage

Ulipristal acetate is a selective progesterone receptor modulator (SPRM) with a half-life of 32 hours (2). World Health Organization was the first one in assaying SPRMs for emergency contraception and, by the end of the trials, developed second generation SPRMs, namely ulipristal acetate, for EC (30).

This oral contraceptive is given in a dose of 30 mg. Unlike any other oral ECP, Ella can be given up to 120 hours after intercourse (2).

Mechanism of action

There are still open disputes about ulipristal acetate's mechanism of action. Majority of scientists agree, and have scientific proof, stating that the main mechanism of action is delay or inhibition of ovulation. Some still consider the effects of ulipristal acetate even after fertilization has occurred; although there are no studies attesting this to be true. If this was recognized to be correct, it would raise many religious and ethical issues (30).

One dose of ulipristal acetate given in mid-follicular phase has shown the ability to suppress growth of the leading follicle. It prevented rupture of 100% of follicles when given prior to LH surge. Main advantage of ulipristal acetate over levonorgestrel is its ability to postpone ovulation for 24-48 h even if given on the day of the LH surge. Once LH peak has been reached, ulipristal acetate is no longer effective. Together with this effect, it also causes reduction in endometrial thickness, delay in histological development and disturbances in progesterone-dependent markers of implantation that later on impedes implantation (29,30).

No significant effect on spermatozoa count was found when ulipristal acetate was taken (31).

Efficacy

Ulipristal acetate is proven to be the most effective emergency contraceptive pill so far. Failure rates of ulipristal acetate are in the range of 0.9% to 2.1% in clinical trials; compared to levonorgestrel range which is 0.6% to 3.1% (32). Comparison of levonorgestrel and ulipristal acetate was conducted in a meta-analysis of two studies. In 72 hours after intercourse, levonorgestrel's odds of preventing pregnancy were 42% lower than the odds of ulipristal acetate, whilst in first 24 hours they were 65% lower; proving ulipristal acetate to be

a more effective method of emergency contraception (33).This longer efficacy of ulipristal acetate over levonorgestrel is attributed to the fact that ulipristal acetate has the ability to postpone ovulation even on the day of LH surge, unlike levonorgestrel which is ineffective once LH surge has occurred, as mentioned before (30).

Side effects

Reported side effects of ulipristal acetate are usually mild and include the following: 2.1 days delay of menses, headache, dysmenorrhea, nausea, fatigue, dizziness, abdominal and back pain (34); very similar to side effects of levonorgestrel.

Availability

In Croatia, ulipristal acetate is registered for use as emergency contraceptive pill (along with some other indications) for over-the-counter use; meaning there is no need for a prescription since 2015. It is sold under a brand name ellaOne® (2).

3.2. COPPER INTRAUTERINE DEVICE

As mentioned before, there are a few types of emergency contraception. One of them is copper intrauterine device. This system causes an inflammatory reaction in the uterus that severely damages the sperm in terms of its motility and quality, thus preventing fertilization (35). Efficacy of this type of emergency contraception is very high, with failure rate being less than 1% (36). Since this type of contraception is not a pill, rather it is a device, and it can be used for other purposes as well, it will not be discussed further.

4. CONTRAINDICATIONS FOR LEVONORGESTREL AND ULIPRISTAL ACETATE

Both contraceptive pills are proven to be very safe (2).

The instructions of manufacturer state the only contraindication, for either levonorgestrel or ulipristal acetate, is hypersensitivity of the recipient to the active ingredient or any other ingredient of the pill (2).

Both contraceptives are not recommended for women with severe liver damage, inherited galactose intolerance, Lapp lactase deficiency or glucose-galactose malabsorption. Contraindications valid for oral hormonal contraceptives do not apply for oral emergency contraceptives (2).

Ulipristal acetate should not be used in women with oral corticosteroid-uncontrolled severe asthma (2).

Levonorgestrel is not recommended in women with higher risk of developing ectopic pregnancy or in women with higher risk of developing deep vein thrombosis (2).

Neither levonorgestrel nor ulipristal acetate cannot be taken during pregnancy because they have no therapeutic effect. If taken during pregnancy, they will not end the pregnancy. Deep vein thrombosis in personal or family history, obesity, treated or existing breast cancer, treated ectopic pregnancy, migraine, cardiovascular diseases, liver diseases, hypertension and diabetes are not conditions considered to be contraindications for ECPs (2).

Both contraceptives are approved for use in all women of reproductive age, starting with the age of 16 (2).

5. MYTHS AND MISCONCEPTIONS ABOUT EMERGENCY CONTRACEPTIVE PILLS

Although emergency contraception has been available for many years now all over the world, the use of it is unexpectedly low. The looked-for impact on unwanted pregnancy rates is not achieved. “Why is that so?” is an important question that needs to be asked.

Various reasons could be behind low use of emergency contraception but I would point out knowledge, or lack of it, to be the most important one.

Since this topic is directly connected to “life or death” decisions, it is of crucial importance for people to be properly and completely educated about the topic. Even before the onset of puberty and sexual maturity, children should start to be informed about matters such as menstrual cycle, fertility, contraception, sexually transmitted diseases, pregnancy, sexual intercourse etc. In order to prevent unwanted consequences, in terms of pregnancy or sexually transmitted diseases, it is important to start the education early on and to build the knowledge throughout the years. People should be aware of their choices and possibilities concerning this topic.

Impact of media must not be taken for granted. In the era where all the important information is carried out through mass media (Facebook, Instagram, YouTube, newspaper, radio, TV etc.), extra caution should be applied. People tend to believe everything they hear not taking into account the source of information. Due to this, it is important to broadcast scientific facts and not public assumptions.

Since emergency contraceptive pills have emerged, they have been connected to many myths and misconceptions about their use and correct mechanism of action. In this paper, I will focus on the biggest ones.

In the following titles, I will name the most common myths, not scientific facts!

5.1. EMERGENCY CONTRACEPTIVE PILLS ARE THE SAME AS ABORTIVE PILL

When going through the online media articles, this myth appears to be number one myth in most of them (37-39). Although I was unable to find many articles claiming people believe emergency contraceptive pills are the same as pills for medical abortion, it is interesting to see many authors recognize the need to emphasize the difference between the two pills.

This is not highlighted only in non-scientific publications, but the scientific community also appears to spot the need for clarification. In Croatia, in 2015, the guidelines for accurate use of emergency contraceptive pills were introduced. They were written for all medical professions and staff by top experts in the field, namely *Hrvatsko društvo za ginekološku endokrinologiju i humanu reprodukciju (HDGEHR), Hrvatsko društvo za ginekologiju I opstetriciju (HDGO)* and *Sekcija ginekologa u primarnoj zdrastvenoj zaštiti (PZZ).* Even in those guidelines, they emphasized non-abortive potential of both contraceptives (2).

Scientific community defines fertilization as fusion of male and female gamete (oocyte and sperm) and formation of a zygote. This point is the beginning of pregnancy (40). Any manipulation with the embryo (and later fetus) resulting in termination of pregnancy is considered an abortion (41).

Measures taken prior to fertilization cannot be considered an abortion since fusion of oocyte and sperm is prevented. Mechanism of action for both contraceptives used today, levonorgestrel and ulipristal acetate, is delay of ovulation. Without LH surge happening, the oocyte won't be expelled from the ovary and it will not reach Fallopian tube where fertilization would take place. Both options are proven to be ineffective once fertilization took place and show no ability of interrupting the progress of pregnancy, if it happened already (42). Due to these scientific facts, this misconception is clearly discredited.

5.2. EMERGENCY CONTRACEPTIVE PILLS ARE EFFECTIVE ONLY IF TAKEN IMMEDIATELY AFTER AN INTERCOURSE

This misconception about emergency contraceptive pills is not unexpected since emergency contraceptive pills are commonly referred to as “morning after pills” (2,43,44).

As mentioned before, both available options for emergency contraception work for a longer period of time, not only 24 hours. Levonorgestrel is effective for 3 days (72 hours) after an intercourse (23), while ulipristal acetate can be taken up to 5 days (120 hours) after an intercourse in order to be effective (2). However, it is advised to take emergency contraceptive pill as soon as possible after an intercourse since the efficacy of both drops over time (33).

It is important to stress that both options are ineffective if ovulation or pregnancy already took place (2).

Since “morning-after pills” is a misleading name for emergency contraceptive pills, it is recommended not to use it, but also to educate women better about the efficacy and duration of action for both emergency contraceptive pills.

5.3. EMERGENCY CONTRACEPTIVE PILLS CAUSE LONG-TERM SIDE EFFECTS AND INFERTILITY

“Besides side effects, like nausea, heavy bleeding and cramps, regular use of emergency contraception may cause infertility and, in some instances, increase the risk of cancer,” is stated by a BBC story about ECPs in Kenya (45,46).

"EC [emergency contraceptives] come with an increased risk for things like blood clots and hormone-related cancers, like many traditional forms of birth control," is another statement from mainstream newspapers in the USA (45,47).

Some articles concerning the myths about ECPs mentioned women's concern stating ECPs can lead to infertility (48).

All of the statements mentioned above are incorrect since there is no evidence connecting emergency contraceptive pills and mentioned side effects.

However, these statements are published and are widely available. In today's world, we cannot afford to ignore the power of mass media. On the example of the article stating vaccine causes autism in children – that was later proven to be wrong and was retracted – we can see the impact of mass media on population. Correct coverage of the story by media is crucial since everything is widely broadcasted. That is why it is imperative for professional to always be prepared to answer questions reporters might have, especially when the topic is concerning health risks, benefits or populations concerns (45).

5.4. THERE IS ONLY ONE OPTION FOR EMERGENCY CONTRACEPTION

It seems many women believe there is only one option when it comes to emergency contraception. They seem to have heard about emergency contraception, but do not know about all the possibilities (49-51).

As stated before, when it comes to emergency contraception, there are two methods available – emergency contraceptive pills and copper-intrauterine device.

Not only they are not aware of the two methods, but they seem to be unaware of the two different emergency contraceptive pills used today – levonorgestrel and ulipristal acetate.

As in all other myths and misconceptions, early and proper education is crucial together with mass media coverage of the topic.

5.5. EMERGENCY CONTRACEPTIVE PILLS ARE INEFFECTIVE IN OBESE WOMEN

There is an article about a woman experiencing difficulties while trying to buy levonorgestrel emergency contraceptive pill in Canada, where they are registered as “over-the-counter” drugs. She wanted to buy the pill in a pharmacy but was rejected by a pharmacist due to her increased bodyweight. The pharmacist did not check her actual bodyweight nor her body mass index (BMI). He/she refused to sell the drug claiming the drug is ineffective in obese women. The woman proceeded to the next closest pharmacy where she got the drug without any difficulties nor any questions asked. At the end of her experience, she was worried about which of the two pharmacists made a mistake; was it the first one with lack of knowledge about emergency contraceptive pills and obesity, or was it the second one who did not warn her about the possible ineffectiveness of the pill in obese women. After some research, she discovered situations like this are not that uncommon (52).

For obese women, copper IUD is proven to be the most effective method. However, emergency contraceptive pills are not proven to be ineffective in overweight women so they should be taken into consideration. Some studies and recommendations suggest use of ulipristal acetate over levonorgestrel in obese women since it has been proven to be slightly more effective (34).

As stated in recommendations published in Croatia in 2015, obesity is not considered as a contraindication for use of emergency contraceptive pills (2).

It is important to understand that not only proper education of medical professional is necessary, but also of people in charge of drug distribution – pharmacists. This is a perfect example of misleading information provided by personal that should be well informed about the topic.

5.6. WOMEN (OR THEIR MALE PARTNERS) NEED A PRESCRIPTION IN ORDER TO GET THE EMERGENCY CONTRACEPTIVE PILL

It seems that many women believe prescription is necessary to get emergency contraceptive pills (49,50).

It can be attributed to that fact it was so in the past. However, today 19 countries in the world allow direct over the counter access to emergency contraceptive pills, while 76 countries in the world allow access to emergency contraceptive pills in pharmacies without a prescription. Croatia falls into the latter category since 2015 (53).

Once access to emergency contraceptive pills without a prescription was established in Croatia, it was a requirement to fill out a questionnaire given by a pharmacist in order to obtain the pill. That protocol was considered by women to be an invasion of privacy and was thought to be completely unnecessary (54). The questionnaire is no longer required to acquire emergency contraceptive pill in Croatia.

FORMULAR ZA IZDAVANJE lijeka ellaOne 30 mg

Podaci upisani na temelju izjave osobe kojoj se izdaje *ellaOne tableta 30 mg*

MBO pacijentice		
Je li *ellaOne* tbl namijenjena za pacijenticu osobno?	DA	NE
Je li se nezaštićen spolni odnos dogodio unutar zadnjih 120 sati (5 dana)?	DA	NE
Prema izjavi pacijentice postoji li mogućnost da je pacijentica već trudna?	DA	NE
Kasni li mjesečnica? Ako da, koliko?	DA, _____	NE
Je li zadnji ciklus bio neuobičajen u bilo kojem pogledu (promjena u obilnosti krvarenja ili duljini trajanja)?	DA	NE
Nakon zadnje mjesečnice, je li pacijentica imala nezaštićeni spolni odnos prije ove situacije?	DA	NE
Je li pacijentica koristila *ellaOne* tbl nakon zadnje mjesečnice?	DA	NE
Uzima li pacijentica druge lijekove, uključujući OTC i biljne lijekove? Ako da, koje?	DA KOJE?_____	NE
Postoji li bilo kakav problem koji bi mogao utjecati na apsorpciju lijeka *ellaOne* tbl poput povraćanja, jake dijareje, upalne bolesti crijeva?	DA	NE
Je li poznata alergija ili kakva nuspojava na *ellaOne* tbl?	DA	NE
Je li pacijentica ikada imala izvanmateričnu trudnoću ili upalnu bolest zdjelice?	DA	NE

Potpis osobe kojoj se izdaje lijek _____

*Potpisom osoba kojoj se izdaje lijek potvrđuje da su gore navedene informacije istinite te da ju je ljekarnik upoznao s djelovanjem, sigurnošću primjene, nuspojavama i drugim važnim informacijama vezano za sigurnu primjenu ellaOne tablete, te

Figure 1. The required questionnaire for emergency contraceptive pill purchase in Croatia in 2015 (https://voxfeminae.net/vijesti/diskriminatoran-ljekarnicki-protokol-i-mogucnost-priziva-savjesti-pri-izdavanju-tablete-ellaone/)

5.7. EMERGENCY CONTRACEPTIVE PILLS ARE A RELIABLE FORM OF CONTRACEPTION AND CAN BE USED AS REGULAR CONTRACEPTIVE METHOD

Due to high efficacy of emergency contraceptive pills, there is a common belief among women that it can be used as a regular and a reliable method of contraception (50,55). Although ECPs are proven to be highly effective, women should be better informed about the ECPs exact mechanism of action; meaning, their efficacy depends entirely on the part of the menstrual cycle in which they are used, and whether the ovulation has already occurred. Besides the issue of unintended pregnancy, there is also a realistic danger of acquiring a sexually transmitted disease (STD), since emergency contraceptive pills do not offer any kind of physical barrier during intercourse (56).

Women seem to believe that once they've taken emergency contraceptive pill, they are protected for the rest of the cycle (44). Use of barrier method of contraception is necessary until the end of the menstrual cycle (2).

Likewise, it is important for women to understand that emergency contraception should not be used as a constant and regular method of contraception. Not only is it not financially viable, but frequent use of emergency contraceptive pills is not recommended due to their ineffectiveness against STDs, their impact on menstrual cycle regularity and higher efficacy of alternative long-term contraceptive methods for regular use (5,23).

5.8. EMERGENCY CONTRACEPTIVE PILLS WILL CAUSE SEVERE ABDOMINAL PAIN, NAUSEA AND SICKNESS

It is a common opinion about emergency contraceptive pills that they cause severe side effects in terms of nausea and sickness (50,57).

Even though this might be true in minority of cases, emergency contraceptive pills side effects are usually mild and quite rare. (26,34).

5.9. EMERGENCY CONTRACEPTIVE PILLS ARE USED ONLY IN THE CASE OF UNPROTECTED INTERCOURSE

It is also important to dispel the belief that emergency contraceptive pills are only intended for unprotected intercourse (44).

Some other indications for emergency contraception use are malfunction of regular methods such as preservative breakage/slippage, forgotten regular oral contraceptive, diaphragm slippage, expulsion of already inserted IUD and in the case of sexual assault (2).

5.10. INTRODUCTION OF EMERGENCY CONTRACEPTIVE PILLS SUPPORTS RISKY SEXUAL BEHAVIOR

Once emergency contraceptive pills were introduced, it was presumed they will encourage risky and irresponsible sexual behavior. In a study conducted in 2004, some women claimed introduction of emergency contraception options is immoral and irresponsible since there is no need for planning of intercourse and precoital contraception (58).

Related concern is that increased use of emergency contraceptive pills will increase the incidence of sexually transmitted diseases and thus increase the cost of public health expenses, while reducing the expenses of unwanted pregnancies. This myth can be debatable since there is an actual possibility of reducing women's' ability to have protected intercourse because their partners may insist on emergency contraception. A study conducted in 2015 in United States of America was researching the correlation between increased access to emergency contraceptive pills and increased rate of irresponsible sexual behavior in women over the age of 18. They found that the policy change at the national level was associated with reduced likelihood of having multiple sexual partners, but no correlation was found with unprotected sexual activity. In state policy changes, there was

also no correlation with increased rate of multiple sexual partners or increased rate of sexual activity; however, these women were more likely to engage in unprotected intercourse (59).

Teenagers educated properly about emergency contraceptive pills improved their knowledge about correct administration of ECPs; yet this did not increase the rate of their engaging in sexual intercourse (60).

6. CONCLUSION

There are many myths and misconceptions when it comes to emergency contraceptive pills. They can be attributed to the lack of knowledge but also to misinformation that is nowadays very easy to spread. In today's world, the influence of mass media is greater than many believe. It became so perceptible during the Covid-19 epidemics when people worldwide relied mostly on mass media. Information found online should not always be trusted and people should be educated to rely mostly on scientific paper when it comes to medicine and new discoveries. Education about responsible sexual behavior should be started early on in children's lives in order to properly prepare them for all misinformation and troubles they may encounter during life. Medical personal, including the pharmacists, should be accurately educated and updated about this topic because their responses to questions and concerns the public may have are of great importance.

The topic of emergency contraception is on the rise in the last few years and, hopefully, it will progress even more.

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9. BIOGRAPHY

I was born in Zagreb on 14th of April, 1994.

After finishing primary school and “Vatroslav Lisinski” music school for piano with great success, I have enrolled into II. Gymansium in Zagreb in 2009 and have finished with great success in 2013.

I have enrolled into Medical studies in English in 2013.

During my studies, I have been a student demonstrator for “History taking and physical examination” for two years.

I was a member of Emed and a class representative for one year.

I have received Dean’s award for a scientific paper on the topic “*Changes in the fatty acid composition and cholesterol content of erythrocytes in Croatian war veterans with post-traumatic stress disorder after supplementation with n-3 polyunsaturated fatty acids”* in 2019.

I will graduate in 2020.

I am proficient in English, Italian and German language.