



Birth Control and Family Planning: Low-Cost Methods of Contraception Acknowledged by Updated Research

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Abstract

On the basis of a steadily-increasing literature on family planning and birth control the paper addresses central questions in the area of cost effectiveness related to contraception. Its aim is to describe the possibilities of effective contraception in instances of limited resources. In doing so it draws attention to the most suitable low-cost methods of contraception presently available and provides detailed analyses of their efficacy. In conclusion it stipulates expansion of their use as well as intensified education on their practicability.

Keywords: Contraception; Family planning; Birth control

Introduction

Numerous are the publications and websites on birth control and family planning and even more numerous the data presented in the various statistical analyses [1]. Among the pivotal topics in these studies are unwanted pregnancies, abortion, and maternal mortality ratio, ie, the risk of maternal death per 100.000 livebirths. These issues are a focus of interest not only in public health research but also in socio-economic investigations, and one of the most frequently emphasized problem is the cost factor for birth control methods.

Efficacy according to Contraceptive Technology Research

Concerning the issue of cost effectiveness, attention must be drawn to a recent statement by the American Congress of Obstetricians and Gynecologists (ACOG) on fertility awareness affirming the low-cost of these methods. Besides cost ACOG highlights additional advantages offered by fertility awareness, namely safety: "Thy cost ver little. Many women like the fact that fertility awareness is a form of birth control that does not involve the use of medications or devices" [2]. Concerning efficacy, the ACOG affirms that "fewer than 1-5 women out of 100" will get pregnant in case of perfect use. In fact, safety and efficacy are the two primary concerns

of women envisaging family planning or birth control. Regarding efficacy, the most influential authority on this issue, contraceptive technology research, has investigated not only the problem of contraceptive failure [3] but also the efficacy of contraceptive methods [4]. As early as 2011, contraceptive technology has summarized the findings succinctly in a Contraceptive Failure Table (CTFailure Table) which is easily available for the international community [5]. In this table one distinction is made between "perfect use" and "typical use" and another one between "first year of use" and "continuing use at first year" [5] Table 1. According to this table, the "Long Acting Reversible Contraceptives" i.e, implants and intrauterine devices, appear as the most effective, above all the implant Implanon (precursor of Nexplanon) with a failure rate of 0.05 for both perfect and typical use. Among intrauterine devices, Mirena (Levonorgestrel=LNg) with a perfect and typical use failure rate of 0.2 is superior to ParaGard (copper T) with a perfect use failure rate of 0.6 and a typical use failure rate of 0.8. About equally effective are Depo-Provera with 0.2 perfect use (6 typical use), NuvaRing 0.3 perfect use (9 typical use), Evra patch 0.3 perfect use (9 typical use), as well as combined pill and progestin-only pill with 0.3 perfect use (9 typical use).

Table 1: Appendix

Methods	Number of Women out of 100 Who Will Not Get Pregnant: "Perfect Use"	*With Typical Use, Number of Women Out of 100 Who Will Not Get Pregnant	How to Use it
Sterilization Surgery for Women	>99%	>99%	One-time procedure; nothing to do or remember.
Surgical Sterilization Implant for Women	>99%	>99%	One-time procedure; nothing to do or remember.



Sterilization Surgery			One-time procedure; nothing to do or remember; condoms should be used for at least 3 months until stored sperm are cleared from the reproductive tract.
for Men	>99%	>99%	
Implantable Rod**	>99%	>99%	Nothing to do or remember, lasts up to 3 years, inserted by clinician.
IUD**	>99%	>99%	Nothing to do or remember, lasts 3-10 years, inserted by clinician.
Shot/Injection	>99%	94%	Need a shot every 3 months, prescription needed.
Oral Contraceptives			
(Combined pill)	>99%	91%	Must swallow pill every day, prescription needed.
"The Pill"			
Oral Contraceptives			
(Progestin-only)	>99%	91%	Must swallow pill everyday. Must be taken at the same time each day. Prescription needed.
"The Pill"			
Oral Contraceptives			
Extended/Continuous Use: "The Pill"	>99%	91%	Must swallow pill everyday. Prescription needed.
Patch	>99%	91%	Put on a new patch each week for three weeks (21 total days). Don't put on patch during the fourth week. Prescription needed.
Vaginal Contraceptive Ring	>99%	91%	Put the ring into the vagina yourself. Keep the ring in vagina for three weeks and remove for one week. Prescription needed.
Male Condom	98%	82%	Must use every time you have sex; requires partner's cooperation. Except for abstinence, latex condoms are the best protection against HIV/AIDS and other STIs.
Diaphragm with Spermicide	94%	88%	Must use every time you have sex.
Sponge with Spermicide	80-91%	76-88%	Must use every time you have sex.
Cervical Cap with Spermicide	74%	60%	Must use every time you have sex.
Female Condom	95%	79%	Must use every time you have sex. May give some protection against STIs.
Spermicide	82%	72%	Must use every time you have sex. Associated with risk of STI and HIV due to vaginal irritation with frequent use.
Emergency Contraception- If your primary method of birth control fails			
Emergency Contraceptives, "Plan B," "Plan B One Step," "Ella"	85%	7 out of 8 women would not get pregnant after using Emergency Contraceptives	Must use within 72-120 hours of unprotected sex. It is most effective taken as soon as possible after the unprotected act. It should not be used as a regular form of birth control.

Food and Drug Administration (FDA) Approved Methods of Birth Control.

*Effectiveness rates are listed for "perfect use" and "typical use."

**Implantable rod and IUD considered Long-Acting Reversible Contraceptives (LARC) and are highly recommended for young women who do not wish to become pregnant, but may want to have children

Concerning the so-called "fertility awareness-based methods" whose typical use failure rate of 24 is based inappropriately on obsolete data from 1995 [5, note 1] the symptothermal method with a perfect use failure rate of 0.4 approximates the efficacy of the pill and progestin-only pill (perfect use 0.3) Evra patch (perfect use 0.3) and NuvaRing (perfect use 0.3) and it exceeds the efficacy

of ParaGard (copper T) with a perfect use failure rate of 0.6. The ovulation method with a perfect use failure rate of 3 appears almost as effective as male condom without spermicide (2 for perfect use) but superior to female condom without spermicide (5 for perfect use). The TwoDay method with a perfect use failure rate of 4 equals coitus interruptus (4 for perfect use) and the Standard Days method with a perfect use failure rate of 5 is superior to diaphragm (with spermicidal cream or jelly) whose perfect use failure rate is 6. Among the definitive methods, male sterilization with a perfect use failure rate of 0.10 (typical use 0.15) is superior to female sterilization with 0.5 for both perfect and typical use. Concerning Emergency contraception [6] i.e. pills or insertion of a copper intrauterine contraceptive, subsequent to unprotected intercourse, contraceptive technology claims that they substantially reduce the risk of pregnancy. Among the products marketed for emergency contraception are Ella, Plan B One-Step, and Next Choice. Lactational Amenorrhea method (LAM) is considered to be a notably effective though only temporary method of contraception, and another method of contraception must be implemented for effective protection against pregnancy, as soon as one of the following conditions arises: menstruation resumes, the frequency or duration of breastfeeds is reduced, bottle feeds are introduced or the baby reaches six months of age. In describing the mechanism of action of the fertility awareness-based methods, contraceptive technology research specifies that the symptothermal method, the most effective of the so-called "fertility awareness-based methods" due to a 0.4 perfect use failure rate, is based on evaluation of cervical mucus to determine the first fertile day of the cycle and on evaluation of both cervical mucus and temperature to determine the last fertile day. (5, note 6) The two methods based solely on the evaluation of cervical mucus i.e. Ovulation and TwoDay, with perfect use failure rates of 3 and 4 respectively, pay attention to the special characteristics of the cervical mucus during the fertile phase of the menstrual cycle. The Standard Days method with a perfect use failure rate of 5 is based on cyclic changes, documented with the help of a calendar, and avoids intercourse on cycle day 8 through 19.

Research on cervical mucus, essential for the Ovulation and TwoDay method, has a long history, and recent publications have elucidated the importance of cervicovaginal mucus secretions not only for contraception but also for fertility [7]. As early as 1972 one of the world's leading medical journals published a study on the symptoms and hormonal changes accompanying ovulation [8]. Popularizing publications have described the specific features of the method [9] and specialized studies have illuminated the function of cervical mucus [10]. As a consequence of intensified research on cervical mucus it is now common knowledge in human physiology that under the influence of estrogen cervical mucus is thinner and more alkaline than under the influence of progesterone. "The mucus is thinnest at the time of ovulation, and its elasticity or spinnbarkeit, increases so that by mid-cycle a drop can be stretched into a long, thin thread that may be 8-12cm or more in length. In addition it dries in an arborizing, fernlike pattern" [11]. Given the easy practicability of the fertility awareness-based

methods (which nowadays can be used in conjunction with smart phone applications as replacement of the originally developed "cycle sheet" for the symptothermal method) and the absence of risks as well as adverse events, it remains unresolved why they are excluded from certain surveys such as the one presented by the FDA [12]. To exclude these methods is unjustifiable not only from an ethical perspective since the principle of informed consent requires completeness of information on all available methods [13] but also from an international viewpoint.

Efficacy according to International Research

Eleven years prior to the publication of contraceptive technology, in 2000, European research has investigated the issue of contraception as a long-known phenomenon in the history of medicine and has endeavored to establish for each single method its proper failure rate [14]. Instead of assigning a single failure rate to an entire group of methods, as is customary in US -based publications, European scholars over the years have made efforts to assess each method individually [15]. In the context of a historical overview, German researchers have highlighted 15 different methods under the traditional terminology and ranked according to the Pearl-Index (number of unwanted pregnancies per 100 woman-years or 1200 months of application). This ranking shows "tubal sterilization" (Pearl index 0.09-0.4) together with "depot-gestagens" (Pearl index 0.03-0.9) as the most efficacious, followed by "monophasic combined pill" (0.1-1.0), "oral hormonal sequential contraceptives" (0.2-1.4) "minipill" [1] "intrauterine pessary" (0.14-2) and the symptothermal method (0.8). [14, p. 60] Concerning the other natural family planning methods, "basal temperature" (Pearl index of 1-3) appears comparable to "diaphragm and spermicide" (Pearl index 2-4) or "condom" [4-5], while "cervical mucus" (15-32) and "calendar" (15-40) roughly approximate the efficacy of "chemical spermicides" [12-20] or "coitus interruptus" (8-38). Due to the Pearl index of 0.8 the symptothermal method was recognized by German research as the most effective of the natural family planning methods "natürliche Familienplanung" and considered to be one of the "safe contraceptive methods" [14]-notwithstanding the problem of irregular cycles, which limits in some instances the practicability of this method and necessitates the additional use of another method. In the same vein, it must be reiterated what physiologists have underscored with respect to cyclic changes, namely the possibility of pregnancy at any point in time of the cycle. The satisfactory reliability of some of the natural family planning methods, emphasized by international research, is just one benefit of these methods; an additional advantage is their usefulness in the area of fecundity. In a study devoted to fertility in AIDS patients using Fertility Awareness-based Methods (FAM) it has been concluded that "FAMs provide effective, economical and accessible options for HIV serodiscordant couples to conceive while minimizing unnecessary viral exposure" [7]. Speaking about HIV, it seems appropriate to draw attention to the other connotations of the terminus "safe" which can be understood also as protection against sexually transmitted diseases. Regarding this connotation the advice given by the FDA should be heeded to

the effect that latex condoms are the best protection, albeit less effective than abstinence: "Except for abstinence, latex condoms are the best protection against HIV/AIDS and other STIs" [12]. Positive assessments of fertility awareness methods must not obscure the fact that these methods are sometimes ranked as the least effective [16]. Such rankings, however, are not based on recent evidence-based research; rather, they can be traced back to unverifiable and obsolete data from the last century [17,18]. Error-prone descriptions of the fertility awareness-based methods appear sporadically in websites of academic institutions [19], but most of these websites ascertain their usefulness and reliability [20,21].

Conclusion

In view of socio-economic studies emphasizing the cost factor as a crucial problem for birth control and family planning, the no-cost of non-hormonal methods is of special interest for specific populations in developed countries and of general importance in the developing world. According to contemporary research, their safety and efficacy are additional assets, and the area of fertility treatments these methods have been considered a viable alternative to hormones for special populations.

Implications

Provisions should be made so as to educate women on the issue of fertility awareness. In-depth counselling will lead to a better understanding of no-cost natural contraception and thus enable women to enhance the efficacy of their contraceptive pursuits. Comprehensive and comprehensible information should enable each woman to exercise her right of self-decision as autonomous individual who "possess enough information to enable an intelligent choice" [13] a requirement not only of medical ethics but also of reputable professional organizations [22,23].

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