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Can I get pregnant from oral sex? Sexual health misconceptions in e-mails to a reproductive health website

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Abstract

Background—This study identifies sexual and reproductive health misconceptions contained in e-mails sent to an emergency contraception website.

Study design—From July 1, 2003 through June 30, 2004, 1,134 English-language questions were e-mailed to http://ec.princeton.edu. We performed content analysis on these e-mails and grouped misconceptions into thematic categories.

Results—Of the questions sent during the study period, 27% (n=303, total n=1,134) evinced underlying misconceptions about sexual and reproductive health issues. Content analysis revealed five major thematic categories of misconceptions: sexual acts that can lead to pregnancy; definitions of “protected” sex; timing of pregnancy and pregnancy testing; dangers that emergency contraceptives pose to women and fetuses; and confusion between emergency contraception and abortion.

Conclusions—These misconceptions have several possible sources: abstinence-only sexual education programs in the U.S., the proliferation of medically inaccurate websites, terminology used in public health campaigns, non-evidence based medical protocols, and confusion between emergency contraception and medication abortion in the media.

Keywords

sexuality; reproductive health; misinformation; contraception; emergency contraception; Internet

1. Introduction

> “my friend (a girl) and i ended up hooking up with a guy we know. As i said, it was nuts....i went down on this guy, than later i went down on my girl friend. later i started thinking! could his sperm be swimming around my mouth and then go up my friend’s kooch???!?!! DOES SHE NEED EC?? i hope you can answer b/c we are for real wigging out!!” (E-mail sent to http://ec.princeton.edu, June 28, 2004)[a]

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[a]We have reproduced quotes with all the spelling, grammar, and punctuation errors of the original e-mails.

Internet resources have become an increasingly important mechanism for the dissemination of health information in the U.S. and worldwide [1,2]. Interactive websites that allow individuals to ask questions or comment on the website's content provide an increasingly important entry point for discussing sexual and reproductive health issues. Questions posed by users reveal a great deal about their general sexual and reproductive health knowledge, their attitudes, opinions, and biases, and conceptual frameworks in which they understand sexual and reproductive health issues.

Launched in October 1994, the Emergency Contraception Website "Not-2-Late.com" (http://ec.princeton.edu) was one of the first websites to provide medical information on the Internet. The website primarily targets a non-specialist audience of women and men seeking information about emergency contraception, providing comprehensive information derived from the scientific literature. The website invites those who have questions about emergency contraception to send an e-mail to the founder of the website. The quote at the beginning of this article was excerpted from one of more than one thousand English-language e-mails sent over the course of a year to the e-mail address provided on the website. Although these questions were sent because the questioner lacks information about some aspect of sexuality or reproductive health, usually about emergency contraception, the purpose of this study is to explore the major misconceptions about sexual and reproductive health that appear in these e-mails. After identifying a number of common themes of misinformation, we reflect on the factors that contribute to and perpetuate sexual and reproductive health misinformation.

2. Materials and methods

The peer-reviewed website http://ec.princeton.edu is hosted on a Princeton University server and is jointly operated by Princeton's Office of Population Research and the Association of Reproductive Health Professionals. The website was originally created in English and Spanish; a French version was added shortly after that, and an Arabic–language site, produced jointly with Ibis Reproductive Health, was added in 2003. The website contains a directory of frequently asked questions, but gives readers the option of e-mailing their own questions to James Trussell, who replies to all English-language e-mails.

Between July 1, 2003, and June 30, 2004, the website received 1,134 English-language e-mail questions (excluding spam and commercial and journalistic solicitations). Of the 1,134 English-language e-mails sent over a year, 593 come from unique e-mail addresses; 181 people wrote more than once, for a total of 541 duplicate e-mail addresses. Of the subset of 303 e-mails that we classified as "misconceptions," 234 come from unique addresses; 23 people wrote more than once for a total of 69 duplicate e-mail addresses. While the people who wrote more than once wrote an average of 3 times in both datasets, the subset of "misconceptions" contains 77% unique e-mail addresses, while the overall set of e-mails contains only 52% unique e-mail addresses. Demographic information about the writer was not solicited but was sometimes voluntarily offered by the author in the e-mail itself. The known demographic characteristics of authors as well as descriptions of the general concerns of writers and overall website use patterns, have been described in detail elsewhere for a larger data set [3,4]. We have limited information about the geographical locations of website users overall; the majority (approximately 65%) are based in the U.S. We do not, however, have information on the geographical locations of those website users who chose to submit questions to the website, so our assumption that the majority of these are also U.S.-based must be necessarily qualified.

We performed a content analysis of all 1,134 e-mails in order to identify the sub-set of e-mails that contained misinformation or misconceptions. For the purposes of this study,

misinformation was defined narrowly. We assumed that almost all e-mail authors were writing because they lacked some information, usually about emergency contraception, so we did not count as misinformation questions about how to use emergency contraception, about its effectiveness, about bleeding patterns, or about pregnancy risk after emergency contraceptive use. Instead, we focused on broader underlying misconceptions about sexual and reproductive health, defining "misconception" as an incorrect belief or assumption about reproductive health processes.

The definition of what constitutes a "misconception" about sexual and reproductive health is potentially subjective but we aimed for high intercoder reliability in our content and thematic analyses by requiring all three study authors to read every e-mail and agree on a final coding. Our method of establishing intercoder reliability was based upon previous content analysis studies [5,6]. Each study author independently read and analyzed all 1,134 e-mails and we identified a group of 303 e-mails (27%) that contained at least one underlying sexual and reproductive health misconception. We then performed a thematic analysis of these e-mails and grouped them into major categories. As we were interested in identifying concerns that emerged repeatedly over the study period, we defined a category as major if at least 23 e-mails (2% of the 1,134 e-mails received in a year) related to that misconception theme. Our study team discussed all discrepancies and final coding was determined by consensus. Detailed definitions of the coding we developed are described in our results.

We used a pre-existing data set with no individual identifiers. This study received a determination of exempt status by Princeton University's Institutional Review Panel.

3. Results

Our content and thematic analyses revealed that 27% of all English-language questions (n=303) received by http://ec.princeton.edu during the study period contained misconceptions, and we grouped these into five major categories. These thematic groups related to the 1) sexual acts that can lead to pregnancy; 2) definition of "protected" sex; 3) signs and timing of pregnancy and pregnancy testing; 4) dangers that hormonal contraceptives pose to women and fetuses; and 5) confusion between emergency contraceptive pills (ECPs) and abortion. An additional 63 e-mails could not be classified into one of these thematic groups. These categories are presented in Table 1. We present here a detailed description of each thematic group and provide excerpts from representative e-mails. These e-mails are presented in unaltered form and thus preserve the language, syntax, grammar, punctuation, and spelling used by the author.

3.1. What sexual acts can lead to pregnancy?

> "On Sat. my boyfriend and I slept together, but since we had no protection, I asked him to keep his boxers on. And ejaculation did not occur. I'm currently on my menstral cycle, is there a chance that I might be pregnant? Should I take emergency contraceptives?" (October 19, 2003)

The largest thematic group of misconceptions that we identified concerned confusion over what acts could result in pregnancy (79 e-mails, or 7% of all e-mails received during the study period). These consisted of e-mails that expressed concern over pregnancy risk from acts which were very unlikely to lead to pregnancy, as in the following examples.

> "I want to know if it is possible for a woman to get pregnan if there is no penetration at all?" (August 18, 2003)

> "If you get your period when you have sex for the first time are you more likely to get pregnant, even if the guy didn't ejaculate???" (January 3, 2004)

Nearly half of the e-mails in this category explicitly ask about the risk of pregnancy from pre-ejaculatory fluid or a related slang term (such as "precum"). The proportion would be higher if we included e-mails in which the pregnancy risk posed by pre-ejaculatory fluid is the implicit concern of these e-mails, as in the man who asked about the need for emergency contraception after "My girlfriend and I kinda had sex, I went in like twice but I didnt ejaculate."

Although clearly related, we classified as "other" 11 e-mails that evinced a generally poor level of knowledge about reproductive processes but did not specifically ask a question about pregnancy risk from a particular act, as in the example below.

> "i need some useful information on how to have sex safely and i also want to know at how many times rounds can one get pregnant." (June 28, 2004)

3.2. What does it mean to have unprotected sex?

> "Could I get pregnant if I'm on the three month shot ? because I had sex but the condom broke. Do the shot keep you from getting pregnant ?" (July 17, 2003)

The second largest thematic category was those e-mails (n=54, or 5% of all e-mails received) that evinced a striking lack of knowledge about what constitutes protected and unprotected sex. The majority of these were women who asked about pregnancy risk or their need for ECPs when they were reliably using other hormonal contraceptive methods.

> "Can you use a emergency contraceptive when using the pill but being in you 2 week unsafe period?" (March 31, 2004)

We did not include in this category those women who were concerned about pregnancy risk after missing a pill (or pills) or who applied the patch late or were late receiving a shot of an injectable contraceptive, whether or not the delay in question posed a significant risk of pregnancy according to World Health Organization guidelines [7]. Rather, we identified cases where women and men seemed to have very little sense of what sort of contraceptive protection hormonal contraceptives provided, particularly during the days of their cycle when they were not taking active hormone pills or using the patch.

One striking finding within this category was the relatively large number of e-mails (n=22, 2% of all e-mails received) in which the writer used the word "unprotected" when worrying about pregnancy risk after sexual intercourse in which the woman was correctly using hormonal contraceptives:

> "If I had unprotected sex and my partner did no ejaculate inside me and I am on birth control right now, should I contact someone about ECP?" (September 8, 2003)

In other words, we seem to be seeing a linguistic trend in which "protected" has become synonymous with "sex with a condom," even when the writer's chief concern is protection against pregnancy, not protection against sexually transmitted infections.

3.3. What are the signs and timing of pregnancy?

> "if you are pregnant, you wont get your period, but what if you have unprotected sex the day before your period, if you are pregnant, will you still get it the next day?" (April 7, 2004)

Another common theme in these e-mails was misconceptions over the signs of pregnancy and the timing of pregnancy or pregnancy tests (n=42, 3.7% of all e-mails received). For example, a number of women wrote shortly after taking ECPs asking if symptoms such as breast tenderness or dizziness were signs of pregnancy or simply the side effects of the pills, even though pregnancy could not occur in such a timeframe (less than a week after intercourse). Similarly, some asked whether (or assumed that) pregnancy could be detected shortly after sex, suggesting a basic lack of knowledge over how long it takes for pregnancy to occur.

> "If you want to check if you are pregnant, would the home pregnancy tests be effective 24 hours after sex?" (July 14, 2003)

Others seemed to believe that it might be possible to get one's menstrual period and still be pregnant, in the context of asking whether emergency contraception was still necessary if menstruation began after sex occurred but before emergency contraception was used.

> "if you come on your period before the 72 hours that you need to get the pill, will i still need to get it or will i definitely not get pregnant?" (April 26, 2004)

An interesting subset in this category is e-mails suggesting that bleeding could be evidence of pregnancy, rather than the lack of it. Five e-mails referred to "implantation bleeding," or the idea that a fertilized egg when implanting in the uterus would cause vaginal bleeding.

3.4. Are ECPs dangerous for women or fetuses?

> "i've heard that birth control pills are bad for girls or women that are or were virgins or haven't had any children because then it makes it harder for them to have children" (August 28, 2003)

A number of e-mails (n=40, 3.5%) expressed the belief or concern that ECPs could be teratogenic or that their use poses a grave health threat to women.

> "Would it be dangerous or life threatening if I took the ecp again, while I am still taking the yasmin" (July 21, 2003)

Other e-mails in this category worried that use of emergency contraception would impair future fertility, increase the risk of breast cancer, cause suicidal tendencies, or damage "the reproductive organs." We did not consider those e-mails asking simply about the risks involved in repeat use of ECPs to be misinformation, unless the e-mails expressed concern about one of the grave dangers listed above (i.e., risk to life or future fertility).

3.5. Is emergency contraception the same as the abortion pill?

> "I think I might be pregnant, buts its been at least 10 days since i had sex, is there any other way besides medical abortion to prevent or abort the pregnancy?" (September 24, 2003)

More than 2% of all e-mails (n=27) to the website confused ECPs with medication abortion. We included in this category e-mails which specifically mentioned the "abortion pill," mifepristone, RU486, or any brand name. We also included questions that ask if ECPs could terminate a pregnancy or could effectively be taken after menstruation was delayed or pregnancy was suspected. We did not include in this category those e-mails from writers who disputed ECPs' status as abortifacient because of a possible post-fertilization effect. We also did not include in this category e-mails which evinced substantial confusion over the time frame of emergency contraception effectiveness, including questions about whether ECPs could be used up to a month after sexual intercourse, unless the question specifically used a term for abortion or pregnancy termination.

3.6. Other

> "i have a question, my friend had sex and she thought she was going to get pregnant so her boy friend said if you drink vineger you won't get pregnant and she didin't get pregnant. Is that true if you drink vineger you won't get pregnant?" (January 11, 2004)

E-mails that we did not group in any of the above categories but that clearly expressed misinformation about sexual and reproductive health (n=63, 5.6%) included those that expressed worry that parental consent was necessary for minors to obtain EC; the idea that regular hormonal contraception could not be used until menstruation begins; the belief that side effects were a marker of drug effectiveness (or that a lack of side effects meant that the pills were "not working"); the fear that recent use of ECPs could be revealed by a home pregnancy test or gynecological exam; descriptions of folk remedies thought to act as postcoital contraceptives (particularly the use of vinegar); the idea that there was a time period after using emergency contraception during which one could not safely have sex (even with barrier contraceptives); and other questions generally manifesting a poor understanding of sexuality or reproductive processes (such as "I need some help on understanding how entire the sexual thing works. How can you fail pregnant?").

4. Discussion

Our content analysis revealed that more than a quarter of the e-mail questions sent to this emergency contraception website over the year manifest a wide range of misconceptions about reproductive health and sexuality. The origins and perpetuation of these misconceptions are undoubtedly multi-factorial and we cannot know from the e-mails sent what the sources of the authors' (mis)information are. However, a search of the Internet and the medical and scholarly literature suggests several possible ways that these misconceptions might be conditioned by broader political and social contexts of sexual and reproductive health. We reflect now on the relationship between these misconceptions and the increase in abstinence-only sexual education programs in the U.S., the proliferation of medically inaccurate websites, the terminology used in public health campaigns, contradictory and non-evidence based protocols within the international medical community, and the confusion between emergency contraception and medication abortion in the media.

A majority of the website users are located in the U.S., where one source of misinformation about sexual and reproductive health may be abstinence-only sex education. As part of the "welfare reform" legislation of 1996, Congress designated new funding for abstinence-only sex education in U.S. schools. Most of the schools accepting such funding prohibited teachers from providing information about contraception, even in response to direct questions from students, except to discuss contraceptive failure rates [8]. Moreover, analyses of abstinence-only curricula have found that, in addition to withholding information from adolescents, they often contain misleading or altogether inaccurate medical information on disease risk and pregnancy rates [9]. Young people are particularly susceptible to myths about sexuality and reproductive health in many different cultural contexts [1–3,10–15]. In a national environment in which the government promotes abstinence from sexual activity until marriage as the only way to prevent pregnancy and transmission of sexually transmitted infections, it is perhaps not very surprising that writers would worry about the pregnancy risk entailed in an act of oral sex, or ask for help in understanding how the "entire sexual thing works," or be confused about what constitutes protected sex.

A second possible source for misconceptions is medically inaccurate information on the Internet. Internet sites dedicated to sexual and reproductive health appear particularly popular among individuals seeking information on issues related to sexually transmitted

infections, contraception, pregnancy, and abortion [16–19]. The relative anonymity provided by health education websites allows individuals to obtain information about sensitive issues that they might otherwise be reluctant to discuss with health service providers, family members, and peers. Websites devoted to health information have proliferated on the Internet, but they range widely in accuracy, and efforts are underway to evaluate the quality of health websites and the strategies that people use to gather and evaluate health information online [20,21].

For example, beliefs in folk remedies for preventing pregnancy after sex have long been documented, and they can readily be found on the Internet [22]. Popular theories about the spermicidal properties of douching with vinegar, Coca-Cola, and other liquids have also been investigated by researchers with varying results [23–25]. Only one, however, has extrapolated from in vitro experiments to speculate that they might work in vivo as a postcoital contraceptive [25]. The search for a carbonated beverage that could double as postcoital contraceptive douche expresses a longing for an inexpensive and widely accessible contraceptive method that reduces women's reliance on pharmaceutical companies and medical controls.

Another misconception in these e-mails that thrives on the Internet despite medical evidence to the contrary is the belief in the pregnancy risk posed by pre-ejaculatory fluid, either during sex in which no ejaculation occurs or in which withdrawal is used as a contraceptive method. Many Internet health resources advise that pre-ejaculatory fluid is teeming with sperm. The U.K. National Health Service website, for example, advises that "millions of sperm are also found in the liquid produced by the penis as soon as it is erect." [26]. The original source for this may be a Masters and Johnson textbook from 1966, which warned of the possibility of pregnancy from withdrawal due to the presence of sperm in secretions of the Cowper's gland [27]. Yet the textbook statement, which was subsequently repeated by other textbooks, was apparently not evidence-based [28]. Three small studies have found no motile sperm in pre-ejaculatory fluid [29–31]. Nevertheless, these websites and the e-mails excerpted seem to attribute an extraordinary potency to sperm, which are thought to escape the penis without ejaculation, "swim" in the mouth, and penetrate clothing to reach the vagina. Such ideas may derive from the iconic representation of sperm in biology texts and popular media, where sperm are often anthropomorphized as masculine, forceful, competitive, and single-mindedly determined to fertilize the egg against all obstacles [32].

Another interesting belief that we found was the idea that implantation causes bleeding, which appears in questions that wonder if vaginal bleeding could actually signal pregnancy rather than the lack of it. Implantation bleeding was hypothesized by Speert and Guttmacher in 1954 [33], but a recent study of vaginal bleeding patterns in early pregnancy found "no support for the hypothesis that implantation can produce vaginal bleeding" [34]. Like the notion that pre-ejaculatory fluid can cause pregnancy, the idea of implantation bleeding seems to have been introduced by the medical profession itself. As Vreeman and Carroll [35] recently pointed out, many medical myths circulate in the medical community as well as amongst the general public.

A fourth possible source of confusion displayed in these e-mails is the terminology of public health campaigns. Campaigns designed to educate the public about the risks of sexually transmitted infections (particularly human immunodeficiency virus) have often used the language of "protected" versus "unprotected" sex in promoting condom use. These e-mails and use of the term "protected" presumably reflects increased awareness of STDs as a result of these campaigns. However, an unfortunate side effect of the emphasis on condoms as the "protection" of choice for sexual encounters is that some people seem to be confused about what sort of protection hormonal contraceptives offer. This confusion likely explains the

relatively large number of e-mails that worry about pregnancy risk after sex in which hormonal contraception but no condom was used and which describe this situation as "unprotected sex." Yet, questions that ask if oral contraceptive pills and injectable contraceptives "keep you from getting pregnant" provoke some wonder about the communication between patients and their medical providers, and about the trust that some patients must have in their providers to take prescription medicines without apparently knowing what these medicines do.

Other misconceptions may not be caused, but certainly are given credence by, dubious medical protocols. Such misconceptions include those concerning the timing of pregnancy, pregnancy testing, and the risks that ECPs pose to a fetus. A number of questioners assume that pregnancy can occur and be detected shortly after intercourse. It takes at least a week after intercourse at the time of ovulation for pregnancy, defined by the U.S. Food and Drug Administration/National Institutes of Health and the American College of Obstetricians and Gynecologists as the implantation of a fertilized egg in the uterus, to occur and be detectable by highly sensitive tests [36–38]. Therefore, pregnancy cannot be detected before ECPs are used, or immediately afterwards. Nevertheless, in the U.S. – where, prior to ECPs being approved for nonprescription sale to those 18 years and older in 2006, emergency rooms were a key point of access for women seeking EC, and remain one for women seeking care after a sexual assault –some hospitals routinely administer pregnancy tests to women prior to giving them ECPs [39]. The *Ethical and Religious Directives for Catholic Health Care Services*, a document that guides medical protocols in Catholic hospitals, suggests that ECPs may be given to rape survivors only after a pregnancy test has first been administered [40]. Even if a woman were already unknowingly pregnant from an earlier act of sexual intercourse, ECPs are not capable of disrupting an established pregnancy or increasing the risk of birth defects [41–43]. There is no medical justification for protocols that require a routine pregnancy test or physical exam before administering ECPs. Such protocols fuel confusion about when pregnancy occurs, when it can be detected, and the health risks posed by ECPs. Pregnancy tests need only be administered when pregnancy is suspected.

Finally, misconceptions about the difference between ECPs and medication abortion are persistent in the U.S. One source of misinformation is the U.S. media, which frequently confuses the two [44]. Most physicians do not routinely discuss emergency contraception with patients [45]. Declarations by politicians that ECPs can act as an abortifacient also undoubtedly contribute to the confusion [46]. However, general awareness and understanding of emergency contraception may be increasing in the wake of the decision by the FDA to allow the nonprescription sale of levonorgestrel-only ECPs and as a result of the associated controversy over the government's delay in bringing the drug over the counter, which has been widely covered in the media [47].

The conclusions we can draw from these data are clearly limited. The website does not obtain demographic information about website users, so the data we analyzed in this paper are not representative of any population except those who write English language e-mails to this website. Further, the knowledge and beliefs that can be inferred indirectly from the content of questions do not fully reflect what these writers believe about reproductive processes but only those beliefs that are revealed incidentally in the course of their asking questions. For all these reasons, the counts that we provide of the number of e-mails in which our thematic areas of concern appear are purely descriptive and not representative. Instead, these thematic groupings express a range of possible beliefs and misconceptions that physicians might encounter in a diverse English-speaking patient population.

There are many factors that might contribute to popular misconceptions about reproductive health, sexuality, and contraception in these e-mails. We have identified some of the major

themes that recur and suggested several possible sources, including misinformation on the Internet, medical texts, contradictory, non-evidence based medical protocols, and the politics of sexual education in the U.S. The take-home message for medical providers, public health workers, and policy makers is four-fold. First, medical providers need to listen attentively to their patients to find out, not only what patients are asking, but also what assumptions lurk behind their questions, so that they can be prepared to debunk myths and misconceptions. Second, professional medical associations, public health organizations, and hospitals should promote and implement medical protocols grounded in evidence-based medicine. Third, we must demand sex education curricula that are scientifically accurate, regardless of the cultural or moral agendas that they seek to further. A final area for educational intervention is medical schools and health professional training programs, since these educational institutions have promulgated several of these myths and misconceptions.

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Table 1

Categories of misinformation, in rank order

Category of misinformation	Number of e-mails	All e-mails containing misinformation, % (n=303)	All e-mails received during the study period, % (n=1,134)
What sexual acts can lead to pregnancy?	79	26%	7%
What does it mean to have unprotected sex?	54	18%	5%
What are the signs and timing of pregnancy?	42	14%	4%
Are ECPs dangerous for women or fetuses?	40	13%	4%
Is emergency contraception the same as the abortion pill?	27	9%	2%
Other	63	21%	6%