

## Birth Control; No Longer Just a Woman's Issue?

In 1960 the first female birth control pill, Enovid, was approved by the FDA and hit the market.<sup>1</sup> While married women celebrated their new ability to plan for children, many single women were banned from receiving the pill, and many Puerto Rican women were mourning the loss of their mothers, wives, and sisters after taking part in clinical trials that abruptly ended their lives in their prime. Not all was golden even for married women who had access to the pill, many women experienced side effects so negative that they discontinued use of the pill. Side effects included blood clots and strokes. Only two years after production there were 132 cases of blood clots, eleven of which resulted in death.<sup>2</sup> Those that complained to their primary care doctors were often dismissed

One would think after 60+ years of the birth control pill that harsh side effects would be minimized, but unfortunately that is not the case. Today side effects may include nausea, headache, and irregular spotting among the least severe, and depression, blood clots, and sudden fainting among the most severe.<sup>1</sup> However other birth control methods are not without their side effects too, including non hormonal methods. Side effects of the copper IUD, a non hormonal birth control method can include painful insertion, worsening cramps, weight gain, and complications with IUD placement that could lead to emergency surgery.

The original creators of the pill did not aim to give women more freedom; instead they were focused on eugenics. George Pinnacus, Marget Singer, and John Rock worked alongside each other to develop a pill that would allow for population control. Pinnacus himself was very open about not supporting women's sexual freedoms, and all three researchers were openly catholic. Many of their experiments lacked consent from subjects and even resulted in several deaths. Of the women who avoided death, many experienced harsh side effects and several left the clinical studies.

### **Birth Control 101**

The Planned Parenthood website lists eighteen types of birth control available today<sup>3</sup>, ranging from highly effective permanent solutions such as vasectomies and tubal ligations to less effective solutions such as the pull out method and spermicide. Here I will discuss 6 of the most common birth control methods used.

Tubal ligations for women and vasectomies for men are both 99% effective,<sup>3</sup> but do require surgery. They are both considered permanent but can be successfully reversed in some cases. Another birth control method that is 99% effective is the IUD which can be hormonal or nonhormonal. This birth control is placed in the uterus by a doctor, and can last for several years. The hormonal IUD slowly releases estrogen and progesterone into the bloodstream over several years, whereas the nonhormonal type, also called copper IUDs, create a toxic environment for sperm, leading to their death before fertilization can occur.<sup>3</sup> The birth control implant is also 99% effective,<sup>3</sup> and is inserted into the upper arm by a doctor. This type is also hormonal and again works by the slow release of hormones into the body. Both the IUD and implant can last around 3-5 years.

Now onto less effective methods, the shot is another hormonal birth control, it is administered every three months and is 94% effective.<sup>3</sup> At 91% effectiveness,<sup>3</sup> we have the hormonal pill, which must be taken daily at the same time to reach the 91% effective rate,<sup>3</sup> however it is often less effective due to user error, one of the biggest downsides of the pill. The

last birth control method I will touch on is condoms. There are two types of condoms, male and female. Male condoms are placed over the penis to collect sperm, and female condoms are inserted directly into the vagina, also to collect sperm. Similar to the birth control pill, the efficacy of condoms ranges from user to user, however in general it is around 79-85% effective.<sup>3</sup> These are also the only two methods that prevent STIs as well as pregnancy.

Today most birth control pills work by using synthetic versions of natural female hormones; progesterone and estrogen, though some pills contain only synthetic progesterone. The pill works by essentially tricking the female body to believe it is already pregnant.<sup>4</sup> When pregnant the body naturally releases progesterone and estrogen at consistent levels. These hormones end up in the pituitary gland where they tell the brain to block ovulation.<sup>4</sup> The same sequence occurs when women take the pill, progesterone and estrogen are taken daily which travel to the brain and prevent ovulation and thus pregnancy. This is similar to how all hormonal birth control methods work such as the IUD and shot which both release hormones at a much slower rate than the pill.

The first birth control pills to be approved by the FDA contained extremely high amounts of estrogen, so high that many doctors began to advocate for lower doses with less health risks as high amounts of estrogen have been associated with increased risk for breast and ovarian cancer.<sup>1</sup> In 1988 birth control pills with lower doses of estrogen were approved.<sup>1</sup> In addition to lowering the amount of estrogen, the pill has evolved in many ways since the 1960s. There are now pills that can give women fewer menstrual cycles or none at all.

## **The Inhumane History of Birth Control**

One of the first researchers to experiment with the possibility of birth control was Gregory C. Pincus, an assistant professor at Harvard who wanted to create a method of population control. Pincus began testing on female rabbits by injecting them with hormones progesterone and estrogen to test their effects.<sup>1</sup> Pincus met John Rock, a gynecologist at a conference in the early 1950s and they began to work together on human trials.<sup>1</sup>

The first trial occurred in 1955, where Pincus and Rock tested their new pill containing progestin and estrogen on twelve female and sixteen male patients at Worcester State Hospital.<sup>1</sup> The two had not received consent from the patients themselves but rather from the patients relatives; only the beginning of misconduct done to study birth control. After they saw success with their medication preventing the ovulation of the twelve female subjects they moved their research to Puerto Rico for further trials.

Pincus and Rock chose Puerto Rico on an immoral basis. The community lacked a good education system and thus the study subjects could be easily exploited.<sup>1</sup> In addition, Puerto Rico did not have the birth control regulations the United States had at the time, which would have made the experiment difficult to conduct in the US. They left the women in the dark, unknown to the potentially harsh side effects. Women reported nausea, blood clots, vomiting, and other symptoms. In total 22% of women dropped out of the study and three women died during the trial.<sup>1</sup> None of this could stop Pincus and Rock who came to the conclusion that the pill could not have played a role in the side effects or deaths.

Despite receiving FDA approval for birth control in the 1960s, many states kept strict birth control laws that dated back to 1873 and the Comstock Act.<sup>1</sup> This act made it a federal offense to take birth control across state lines due to the dominant view that birth control was obscene and caused sexual promiscuity. The passing of this act caused a ripple effect across the

United States, with 24 states adopting their own anti birth control laws, including Connecticut's Barnum Act. The Barnum Act made birth control illegal to use even in your own home, with consequences of arrest and imprisonment.<sup>1</sup>

## **The Ethics and Eugenics of Birth Control**

The unfortunate history of birth control does not end there. Thousands of women underwent forced sterilization through the 1900s due to the ever popular eugenics movement. In British Columbia, legislation allowing the sterilization of Native American school children passed in 1933.<sup>5</sup> These children were forcefully removed from their homes to attend school institutions run by Christians who wished to assimilate them. However these children often faced rape, torture, sterilization, and death during their time.

Sterilization was not only done on school aged children, but adults as well. This was done using a few different methods. Many women underwent false operations; ones where they thought they were going in for one ailment but instead woke up without a uterus. Other women were forced to drink radioactive iodine.<sup>5</sup> Many hospitals and private organizations paid up to \$300 for each sterilization performed.<sup>5</sup> Eventually more legislation would pass including the Alberta Sterilization Act.<sup>5</sup> It is estimated over 2,800 mental hospital patients were sterilized using this act. The act lasted 43 years until 1972.<sup>5</sup> Sterilization laws were not only present in Canada. In 1907 the Governor of Indiana authorized the sterilization of criminals and the mentally ill. After some discourse about the law, the US Supreme court upheld it in 1927 by a vote of eight to one.<sup>5</sup> By the 1980s, around 63,000 Americans had been sterilized. Over 90% of the costs were being funded by the Health, Education, and Welfare Department which was disbanded in 1979.<sup>5</sup>

Those hit hardest were the Native American populations that will never recover. Through the 1970s at least 25% of native women ages 15 to 44 had been forcefully sterilized, equalling out to be 60,000-70,000 women.<sup>5</sup> The problem continued on even after forced surgical sterilizations were made illegal. Once the birth control shot hit the market in 1992, the Eugenics movement turned to use chemical sterilization. Health organizations had even administered the shot before its FDA approval to non-consenting Native American women.<sup>5</sup>

Unfortunately coerced sterilization is still occurring in many places. There are organizations around today who will pay women a lump sum of money to either undergo a tubal ligation or more frequently an implant or IUD. Many of these organizations target the homeless, former drug addicts, and formerly incarcerated women who they deem unfit for motherhood. On the opposite side of the spectrum, today many women who seek out sterilization for themselves are denied access. Doctors often require husband approval, a certain number of children to have been born, and/or the women to have reached a certain age. Many women who seek out hysterectomies due to medical reasons are also denied under these circumstances. My own mother who sought a hysterectomy at the age of 40 after having two children had to get my father's written approval to do so before her doctor would even consider it.

## **What about Male Birth Control?**

There are several different male birth control methods being researched currently. They range from drugs such as Adjudin which inhibits sperm production by creating a barrier in the vas deferens to phenoxybenzamine which is an oral medication that causes dry ejaculations, and

many others. Although none of these drugs are close to FDA approval, many show great promise in inhibiting fertilization with minimal side effects.

Adjudin has been at the forefront of male birth control research since the 1990s. It works by inhibiting sperm motility using an injectable hydrogel composed of sodium alginate, calcium carbonate, and glucono delta-lactone.<sup>6</sup> Ethylenediaminetetraacetic acid (EDTA) is added to the calcium carbonate. EDTA and calcium ions form a complex together, lowering the free calcium ion concentration in semen. Calcium ions ordinarily stimulate sperm maturation, and thus when free calcium concentration decreases, sperm motility is limited.<sup>6</sup> In addition the hydrogel creation itself produces an acidic environment, further limiting sperm motility.<sup>6</sup> Adjudin has been successful at inhibiting sperm movement on both rat and human sperm cultures. When injected into the vas deferens living rats themselves no sexual behavior was altered and no sperm was produced.<sup>6</sup> Adjudin will likely be in the form of a patch or implant when it hits the market.

Another promising option for male contraception is the drug phenoxybenzamine. Phenoxybenzamine is an adrenergic blocker most commonly used to reduce high blood pressure. Researchers began to investigate this drug as a possible contraceptive after they found patients in psychiatric hospitals being treated with phenoxybenzamine for anxiety disorders could not ejaculate.<sup>7</sup> The dosage of phenoxybenzamine correlates directly to the quantity of semen produced. Some men only required 10mg of phenoxybenzamine a day whereas others required up to 30mg a day for dry ejaculation.<sup>7</sup> Phenoxybenzamine would work as a non hormonal contraceptive method, and researchers found treatment with phenoxybenzamine did not alter the hormonal balance of men.<sup>7</sup>

The biggest concern with the use of phenoxybenzamine as birth control is the dry ejaculation itself. Although it shows promise by not allowing sperm to exit the male body, it is risky if that sperm enters the bladder instead, called retrograde ejaculation, as it has potential to cause fertility issues in the long run. However researchers have found no evidence of retrograde ejaculation occurring with phenoxybenzamine after urinalysis.<sup>7</sup> This method of birth control only exhibited one side effect at 20 mg doses or less; dry ejaculations.<sup>7</sup> This is great news for men concerned about the possible side effects associated with male birth control. Unlike female birth control that must be taken daily, phenoxybenzamine only needs to be taken seven days before female ovulation and five days after, another great advantage.

Unlike female birth control which began its research in 1955 and was approved for the market in under 5 years, male birth control has been undergoing research for decades without any approval for the market. Why is that? From the standpoint of the original researchers it would be that there is simply no need. Women are the promiscuous sex, not men. Women are the ones that need self control, not men who can do as they please when they please. However that is not the case today as we have grown more as a society and have somewhat abandoned the negative connotations surrounding women's sex lives. Today the main reason we do not yet have a male birth control is the risk factor involved. For instance, the female pill increases the chances of developing blood clots, but pregnancy increases the chances of developing blood clots at a much higher rate so the risks balance each other out.<sup>8</sup> For men however, there is no risk balancing, only the risk of the birth control itself. Many drug companies in recent years have completely stopped male birth control drug trials<sup>8</sup> because they feel the cost does not outweigh the benefit and there is little promise showing FDA approval in the next few years. This is not the end however. There are still many small private drug companies working towards effective male contraceptives with limited side effects.

## UCSB Male Birth Control Survey

After thorough investigation into possible male contraceptives, I wanted to gather the opinions of students, staff, and faculty at UCSB. I did this by creating an anonymous Google forum where I asked for each participants' sex and opinions on male birth control. More specifically I asked men if they would feel comfortable taking a male birth control pill to prevent pregnancy and I asked women if they would trust their male partner to take birth control to prevent pregnancy. I allowed participants to answer with a yes, no, or 'other' response. In choosing the 'other' response, they were able to further explain their answer. I shared this forum on November 8th 2021 on the College of Creative Studies UCSB Discord, with friends, and with my peers. In total I received 27 responses; 16 males and 11 females.

In the end, 81.3% of men answered yes, they would take birth control to prevent pregnancy, 6.3% responded with no, and an additional 12.6% of men chose the 'other' option to explain their response. All of the men who answered with 'other' said they would consider birth control only if it had limited to none side effects. One response I received was "I definitely like the idea of it, but me actually taking the pill or not will depend on the side effects, and their severity". It was surprising how many men answered with a straight yes response, whether that is due to their utter willingness to take a contraceptive or their unwillingness to type a full response is unknown.

What was more interesting however were the female responses. 54.5% of females responded with no, they would not trust their male partner to take birth control and 45.5% said yes they would trust their male partner. Unlike the male responses that were overwhelmingly positive towards birth control, women appeared split on the issue. Unfortunately I did not receive any written responses from women, but their reluctance may be due to a few reasons. One being for women who have multiple partners, it would be much easier for them to be the ones on birth control then to make sure each and every one of their male partners is on birth control. Another reason may be due to the lack of stakes involved for men. For instance if a man were to miss a pill, he himself is not the one who would have to deal with the consequences of pregnancy. Women want to feel in control of their own bodies and reproductive systems, would having their male partners take birth control make them feel on edge?

## What does the Future Hold?

Current research is showing great promise on the development of a male birth control however it may be another ten to twenty years before any hit the market, why is that? The big roadblock here is money. Researchers can perform all the small scale testing they want, but the move to large human trials is costly. This is a cost many drug companies are reluctant to front as female contraceptives already exist. Another concern on the pharmaceutical companies' part is surrounding birth defects.<sup>8</sup> Birth defects are common in the population, but there is an additional risk of being sued by users of male birth control claiming the contraceptive caused a birth defect. These are big risks most large scale pharmaceutical companies are not yet willing to take.

Not all hope is lost however. Many researchers have devoted their working lives to finding a solution for male contraception, and they will continue to perform research until they reach their ultimate goal of FDA approval. The development of male contraception may lead to new doors being opened for research into male fertility issues and male reproductive cancers. UC Davis is showing great promise in their hormonal male birth control research. In 2020 they

received funding from the National Institutes of Health for phase two testing of their contraceptive.<sup>9</sup> They are performing testing in 13 cities worldwide for their two year study where male subjects apply a daily contraceptive gel made of synthetic progesterone<sup>9</sup> to prevent pregnancy.

Male birth control methods have shown remarkable advances over the past few years, providing evidence for safe and effective birth control with minimal side effects. Hopefully future large scale male birth control trials will be much more ethical and men will not have to deal with the cruel conditions their female counterparts had to endure.

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