

## Injectable Depot Medroxy Progesterone Acetate: A Safe Contraceptive Choice in Public Health System of India

### Background

India was the first country in the world to launch a family planning programme, as early as 1952, with the main aim of controlling its population. India's population has already reached 1.26 billion and considering the high decadal growth rate of 17.64, the country's population is slated to surpass that of China by 2028.<sup>[1]</sup> Over the years national family planning programme too has evolved with a shift in focus from merely population control to more critical issues of saving the lives and improving the health of mothers and children through use of reversible spacing methods leading to reduction in unwanted, closely spaced and mistimed pregnancies and thus avoiding pregnancies with higher risks and chances of unsafe abortions.<sup>[2]</sup> Presently the spacing options are limited to only condoms, Intra Uterine Contraceptive Devices (IUCDs) and oral pills contributing to 5.6%, 1.5% and 4.1% share of modern Couple Protection Rate (mCPR) respectively [Figure 1]. Evidence of contraceptive method mix clearly indicates that with the addition of a single method there is a linear increase in mCPR by 3%-4%. Development of a long-acting reversible contraceptive was a goal of family planning researchers for many years.<sup>[3]</sup>

### What is new

The injectable contraceptives contain synthetic hormones resembling the natural female hormones. When administered (intramuscular/subcutaneous) there is a slow release of hormone into the blood stream and it provides protection from pregnancy for a long duration of time to the client. Injectable Depot Medroxy Progesterone Acetate (DMPA) is an aqueous suspension of microcrystal for depo injection of pregnane 17 alfa – hydroxyprogesterone – derivative progestine medroxyprogesterone acetate. Depot Medroxy Progesterone Acetate can be given through intramuscular route (DMPA-IM) or subcutaneous route (DMPA-SC).<sup>[1,4]</sup>

Injectable contraceptive (DMPA) mainly inhibits ovulation by suppressing mid cycle peaks of Luteinizing Hormone (LH) and Follicle Stimulating Hormone (FSH), it also does the thickening of cervical mucus due to depletion of estrogen and the thick mucus prevents sperm penetration into the upper reproductive tract. Apart from this it does thinning of endometrial lining due to high progesterone and depleted estrogen, making it unfavorable for implantation of fertilized ovum. DMPA may cause a delay in the return of fertility. Since one injection is effective for 3-4 months, the return of fertility takes 7-10 months from date of last injection (average

4-6 months after 3 months effectivity of last injection is over). A DMPA injection can be started any time if it is reasonably certain that the woman is not pregnant. In lactating breastfeeding women DMPA can be started after 6-week post- partum whereas in non-breastfeeding women it can be started anytime within 4 weeks after ruling out pregnancy. A physical examination is always an important part of good reproductive healthcare but recent scientific studies have shown it is not required for the provision of DMPA.<sup>[4]</sup>

### Safety and effectiveness

DMPA is a safe contraceptive. Studies by World Health Organization (WHO) on over 3 million woman months of DMPA use give reassurance that DMPA presents no overall risks for cancer, congenital malformation or infertility. Also an extensive research has found that DMPA use exerts a strong protective effect against endometrial cancer, also has not been found to affect the risk of developing liver cancer in areas where hepatitis B is endemic, does not cause any significant changes in blood pressure or on the coagulation of the fibrinolytic system affecting thrombosis, keeps the fertility intact although it takes a woman few months (4-6 months) longer to become pregnant after discontinuing DMPA than Combined Oral Contraceptives (COCs), IUCDs or barrier methods. Studies have found no differences in the health, growth, sexual development, aggression, physical activity or sex role identity of teenage children exposed in utero to DMPA as compared with no in- utero exposure. DMPA is the fourth most prevalent contraceptive and is widely used as an effective, safe and acceptable method of contraception across the world. It is estimated that currently, an estimated 42 million women worldwide use injectables as a method of choice. It is a highly effective contraceptive method. With a standard regimen the first year effectiveness is 99.7% when the drug is used correctly. The perfect use failure rate of 0.3% is lower in comparison to 0.5% of female sterilization, 0.8% of IUCD and 3% of COCs.<sup>[5]</sup>

### Contraceptive Benefits

A private and confidential method, convenient and easy to use (does not require daily routine or additional supplies), acts for 3 months with a grace period of 4 weeks, completely reversible, does not interfere with sexual intercourse/pleasure, pelvic examination not required prior to use, suitable for women who are not eligible to use an estrogen containing contraceptive, suitable for breast feeding women (after 6 weeks postpartum) as it does not affect quantity, quality and composition of breast milk, provides

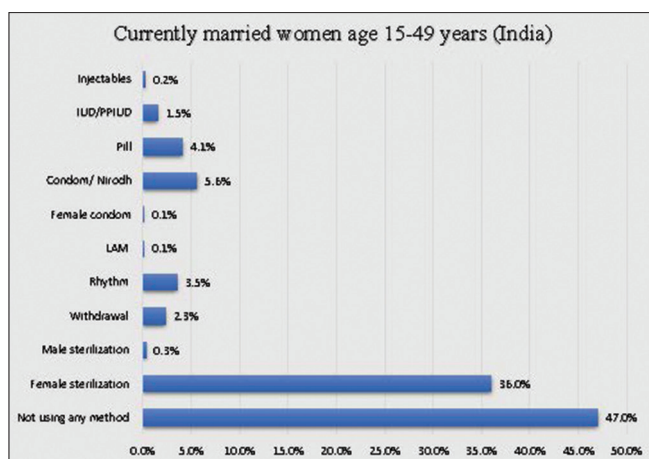


Figure 1: What Contraceptive Methods do Women Use (Source: NHFS-4, 2015-2016)

immediate postpartum (in non-breastfeeding women) and post-abortion contraception, may be used by women at any age or parity if they are at risk of pregnancy.<sup>[6]</sup>

### Non-contraceptive benefits

It decreases menstrual cramps and reduce pre-menstrual syndrome/tension, improves anemia by reducing menstrual blood loss due to menstrual changes such as amenorrhea, reduces the symptoms of endometriosis, decreases benign breast disease and ovarian cysts, helps to prevent uterine tumors, reduces the incidence of symptomatic pelvic inflammatory disease (PID), protect against endometrial cancer and possibly ovarian cancer, reduces sickle-cell crises in women with sickle-cell anemia, protects against ectopic pregnancy (since ovulation does not occur).<sup>[6]</sup>

### Limitations

DMPA injectable contraceptive does not protect against Sexually Transmitted Infections (STI)/Reproductive Tract Infections (RTI) and Human Immunodeficiency Virus (HIV) infection, once taken its action cannot be stopped immediately, it causes changes in the menstrual cycle and bleeding due to its inevitable effect on a woman's body hormones, it has to be repeated every three months to achieve desired contraceptive effectiveness, longer duration for return of fertility (4-6 months). With consistent use of DMPA, bone mineral density decreases by 5%-6% in 5 years, with most loss happening in first 2 years.<sup>[7,8]</sup>

### Special issues on DMPA

There is evidence of a possible increased risk of acquiring HIV among progestin-only injectable users. Uncertainty exists about whether this is due to methodological issues with the evidence or to a real biological effect.<sup>[9,10]</sup> On March 2, 2017, the WHO, in its Medical Eligibility Criteria for Contraceptive Use, changed use of DMPA injectable products among women at high risk of HIV

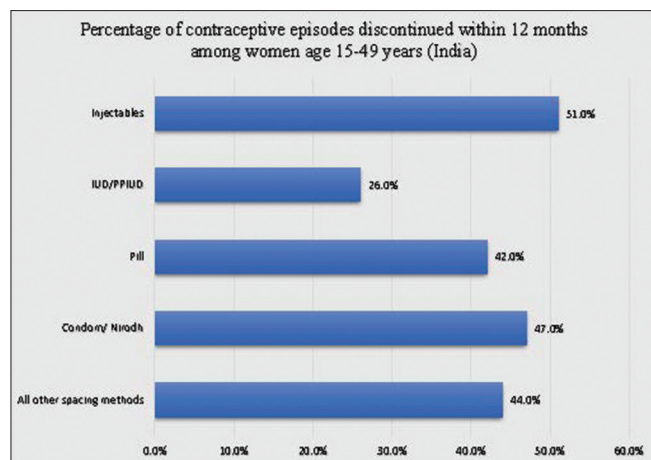
acquisition from category 1 to Category 2. This means that for women at high risk of HIV, the advantages of using DMPA products generally outweigh the theoretical or proven risk. Women should not be denied progestin-only injectables because of concerns about the possible increased risk of HIV. Rather, women considering progestin-only injectables should be advised about these concerns, about the uncertainty over whether there is a causal relationship, and about how to minimize their risk of acquiring HIV, including correct and consistent use of condoms, antiretroviral therapy initiation for partners living with HIV where appropriate, and pre-exposure prophylaxis are available. The ongoing Evidence for Contraceptive Options and HIV Outcomes (ECHO) study is designed to fill this gap and provide robust evidence on the relative risks (HIV acquisition) and benefits (pregnancy prevention) between three effective contraceptive methods (DMPA-IM; levonorgestrel implant; copper intrauterine device).<sup>[11,12]</sup>

### DMPA subcutaneous versus DMPA intramuscular

DMPA-SC offers more women (especially those who face barriers when interacting with the health system) access to a new voluntary contraceptive method that could meet their needs and reproductive intentions.<sup>[13,14]</sup> New acceptors which often include younger clients, and younger clients may prefer DMPA-SC if it is available closer to their homes and because the needle is smaller than the intramuscular needle, although proximity and needle size are traits that many users find attractive.<sup>[15,16]</sup> One reason that clients are attracted to DMPA-SC is the cost and time savings that it offers. In community-based distribution settings, a woman would not need to travel to a clinic since it is offered in her community. In self-injection settings, clients are often given 2-3 doses, reducing the number of trips they would need for resupply. DMPA-SC may also ameliorate the high contraceptive discontinuation rates that are typical of intramuscular injection. The typical discontinuation rate at 12 months for DMPA-IM is 40%-50%, but studies have found that DMPA-SC self-injectors have a more than 50% increase in continuation through 12 months compared with a provider administered injection.<sup>[10]</sup>

### Barriers

Misaligned government policies and priorities (e.g., favoring provision of contraceptives by medical personnel), opposition by medical professionals and social and cultural norms and dynamics. Lack of system capacity for DMPA distribution (e.g., delivery or administrative challenges, lack of equipment, supply chain stock-outs due to mismanagement, and staff burden), competing alternatives for political or consumer attention, data collection challenges and lack of knowledge/awareness.<sup>[17]</sup> Since when the DMPA is being offered free in the public health system the acceptance rate increased from 0.1% in 2006 to 0.2% in 2016 but is very low as compared



**Figure 2: Contraceptive Discontinuation Rates for Modern Spacing Methods (Source: NHFS-4, 2015-2016)**

with other contraceptive methods [Figure 1]. The overall lower acceptance rate is also due to inadequate level of knowledge or awareness (69%) about injectables among women. Also, discontinuation rates are high (51%) as compared with other contraceptive methods [Figure 2] and the most common reason is side effects or health concerns which can be overcome by in-depth counselling. In-depth counselling consists of detailed information of the drug along with emphasis on how to handle the side effects and this will be given at each reinjection visit every three months.<sup>[18]</sup>

## Conclusion

The ability for a woman to receive DMPA injections every 3 months without a daily or pericoital regimen, and usually in a private room without others being aware of her contraception use, were critical characteristics of the product that can enable scaling up in several low-income contexts. These features figure prominently in the marketing of DMPA and stand in contrast to other types of contraceptive products, such as oral pills or condoms, which are more likely to be observed by or require negotiation with other household members. Dialogue with community at early stages and throughout implementation effective education through social marketing, use of data to improve program performance and maintaining compatibility with religious norms are key for its scaling up and to eventually counter the challenge of unmet need of family planning methods. Providing adequate supports such as staff training and clinic space and using peer social networks and conducting stakeholder assessments from community can make DMPA a successful choice to combat the menace of population explosion in India.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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**Received: 06 May 19 Accepted: 13 Aug 19**

**Published: 26 Nov 20**

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	<p><b>DOI:</b> 10.4103/ijpvm.IJPVM_163_19</p>

**How to cite this article:** Gupta V, Chawla S, Goel PK. Injectable depot medroxy progesterone acetate: A safe contraceptive choice in public health system of India. *Int J Prev Med* 2020;11:180.