

EMERGENCY CONTRACEPTION IN REPRODUCTIVE HEALTH CARE: PROGRAMME INTRODUCTION GUIDELINES[#] (Strengthening of Overall Contraceptive Programme)

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ABSTRACT

The high incidence of unwanted pregnancy and unsafe abortion and their hazardous consequences are related to inadequate or poor implementation of reproductive health care programme and services. In this article, the definition, dimensions and different inter-related components of reproductive health and its care have been described. The utility and scope of emergency contraception in three major components of reproductive health care have also been discussed. The types of emergency contraceptives (EC) available, the rational basis in their use, probable modes of action, the side effects and their management have been described. A general guideline for their use has also been provided. The other important aspects of the paper include the factors that influence acceptance and continued use of contraceptives, the problems that are encountered in the transfer of technology from the clinic to the community and systematic steps for programme introduction of contraceptives, including emergency contraceptives.

It is sincerely hoped that this article will serve as a valuable technical resource material for the administrators, programme officers, trainers of health personnel and the service providers at different levels and settings.

Key-words: Reproductive Health, Unsafe abortion

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It is estimated that about 40-60 million women in the world seek termination of unwanted pregnancy every year. Majority of these occurs in developing countries and most abortions are carried out under unsafe conditions. In fact, unsafe abortion is one of the great neglected problems of reproductive health in developing countries. At least 70,000 of approximately 58,00,000 maternal deaths that occur annually are a consequence of complications of unsafe abortion procedures.¹

The high incidence of unwanted pregnancy and unsafe abortion is mainly due to unmet need of family planning resulting from non-availability of effective family planning programme/methods or poor quality of reproductive health care services. In recent years, the importance of integrated and comprehensive reproductive health (RH) care is being increasingly realized and emphasized². Three major components of RH care are directly related to this problem.

- a) Women's health and safe motherhood including safe and humane management of unwanted pregnancy and consequent induced abortion;
- b) Effective family planning ensuring free reproductive choice, gender equality and fulfilling women's reproductive rights; and
- c) Adolescents' reproductive health and proper development of their sexuality.

This paper deals with the role of emergency contraception in addressing the above issues, its successful utilization in the programme and the steps for overall strengthening of contraceptive programme.

DEFINITION AND DIMENSIONS OF REPRODUCTIVE HEALTH

As defined by the WHO and adopted in the International Conference on Population and Development (ICPD, Cairo), Programme of Action³, "Reproductive health is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity in all the matters relating to the reproductive system and its functions and processes. Reproductive health, therefore, implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so. Implicit in this last condition are the rights of men and women to be informed of and to have access to safe, effective, affordable and acceptable methods of family planning of their choice, as well as other methods of their choice for regulation of fertility which are not against the law, and the right of access to appropriate health care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant. In line with the above definition of reproductive health,

reproductive health care is defined as the constellation of methods, techniques and services that contribute to reproductive health and well being by preventing and solving reproductive health problems. It also includes sexual health, the purpose of which is enhancement of life and personal relations, and not merely counselling and care, related to reproduction and sexually transmitted diseases”.

Maternal health is directly related to the state of women’s health which in turn is related to the status of women in the family and the community at large and their development. Both women’s health and maternal health are largely influenced by the status of their health during infancy, childhood and adolescent period. This has also been emphasized in other WHO documents.^{4,5} Children and adolescents of today would develop into adults of tomorrow, entering into reproductive phase of life. Children need integrated development throughout. Subsequently, the adolescent period, which denotes the transition between childhood and adulthood, is also very important. At this time, the adolescents face the problems of growing up and the foundation for human sexuality is laid. Human sexuality comprises the knowledge, beliefs, attitudes, values and behaviours of individuals regarding sex. Therefore, a comprehensive concept of reproductive health should encompass all these aspects mentioned above, and its care needs an integrated approach.^{2,6}

COMPONENTS OF REPRODUCTIVE HEALTH AND REPRODUCTIVE HEALTH CARE

The different components of comprehensive reproductive health care are encompassed within the following eight areas: ^{2,6,7}

- 1) Women’s health, safe motherhood (including safe and humane management of unwanted pregnancy and abortion), and women’s development.
- 2) Child survival, child health, and child development.
- 3) Adolescence, sexuality development, adolescence education and adolescent’s health care.
- 4) Effective family planning ensuring free reproductive choice, gender equality and greater male participation.
- 5) Prevention, detection and management of reproductive tract infections, sexually transmitted diseases (STDs) and AIDS and the cancer of the reproductive system.
- 6) Sexual health
- 7) Prevention, and detection and management of genetic and genetical-environmental disorders.
- 8) Reproductive health care of elderly persons.

Obviously all the above components of reproductive health care may not

be organised overnight, but these can be developed in an incremental fashion. Many of these are already at various stages of development. Depending on the urgency of the prevailing problems and the availability of resources, some of these components would need further priority attention and emphasis. The subject and focus of this presentation are directly related to three components of reproductive health care stated above at serial numbers 1, 3 & 4.

Reproductive Health Status in India⁸⁻¹⁰

India was the first country in the World to adopt family planning as an official programme in 1952. As a result of various health and family welfare programmes over the past fifty years, significant improvement has occurred in various health parameters, although these are not upto the desired or targeted levels. The crude birth rate has declined from 41.7 in 1951 to 26 per cent in 1999, and it is estimated that more than 200 million births have been averted. But the growth rate has not declined substantially so far. The couple protection rate is currently about 48-50 per cent. The infant mortality rate has declined significantly from 146 (1951-61) to 68 (1998-99). Although maternal mortality has declined, but it is still quite high. More than 100,000 women die every year due to pregnancy and childbirth related cause. About 78 per cent of conceptions each year are unplanned and 25 per cent are definitely unwanted; many of them resort to abortion.

It is estimated that over 11 million abortions occur every year in India, of which about 7 million are induced and a large proportion of these are illegal and are being carried out in unsafe conditions. This results in 15 to 20 thousand abortion related deaths and high incidence of associated morbidity, which are largely preventable.

In India, adolescents represent one-fifth of the population. Marriage and fertility within this group are disturbingly high. Among the adolescents, about 20-30 per cent of males and 10 per cent of females are sexually active before marriage. Both unmarried and married adolescent women are less likely to have decision-making power in their sexual relationship and are thus susceptible to unprotected sex. Thus, a significant number of adolescent girls and youths are reported to have become sexually active and they are exposed to unprotected sexual act. This results in unwanted pregnancy and they resort to induced abortion in unsafe conditions due to social stigma.

DEFINITION, UTILITY AND SCOPE OF EMERGENCY CONTRACEPTION

Definition

Emergency contraception (EC) is a method of preventing pregnancy that

can be used in the first few days following unprotected sexual intercourse. These are effective and safe for most of the women. It is estimated that the chance of pregnancy after each unprotected intercourse is about 8 per cent; an effective EC can reduce this risk to 2 per cent or less. The methods include hormonal pills and copper-releasing intrauterine contraceptive device (Cu-IUD). EC pills are sometimes referred to as "morning after" or "post-coital" pills. However, these terms do not convey the correct timing, as EC pills can be used upto three days after unprotected intercourse in a fixed schedule. In addition, these terms do not convey the important message that EC pills should not be used regularly and these are intended for "emergency" use only. Thus, the term emergency contraceptive pills is the correct way of referring to this contraceptive method ¹¹.

Utility

The women may be exposed to unprotected sexual act under the following circumstances, and the ECs will be useful:

- a) Lack of contraceptive use
- b) Breakage or slippage of condom
- c) Missed oral contraceptive pills for more than three days in a row
- d) Expulsion of IUD
- e) Failed coitus interruptus
- f) Forced sex against her will
- g) Victims of sexual assault or violence.

Scope

A. Role of Emergency Contraception in Family Planning - The occurrence of unwanted pregnancy and induced abortion demonstrates the need for emergency contraception. Often the inadequacy of family planning services in terms of non-availability and/or quality has contributed to this need.

Therefore, the introduction of EC into the family planning programmes and its distribution through clinic and non-clinic channels are being recommended by a number of agencies and organizations to prevent unwanted pregnancies and their untoward consequences.¹²⁻¹⁴ A conference on emergency contraception held in Bellagio in April 1995 highlighted the facts that the use of emergency contraception could avert unwanted pregnancy and consequently an induced abortion¹². The participants called upon family planning providers to include emergency contraception in all family planning programmes and in all national essential drug lists. Within a few months of the meeting, the WHO Expert Committee on the Use of Essential Drugs acted upon this recommendation. Realizing the need and utility of ECs, seven international agencies including the WHO and IPPF, which are committed to expanded use of

all safe and effective methods of fertility regulation including EC, formed a consortium. Its goal is to identify, through model introductions and operations research, the specific "best practices" to broaden access to hormonal emergency contraceptions.^{12,13}

B. Preventing Unwanted Pregnancies and Unsafe Abortions – In spite of the effectiveness of modern contraceptives large number of unwanted pregnancies occur throughout the world and many women seek termination. Out of 40 to 60 million abortions performed each year in the world, approximately 20 million of them are carried out in unsafe conditions. This is a reflection of the unmet need for family planning.¹ Lack of or limited access to and failure or incorrect use of contraceptives play an important role in this picture.

If ECs were easily available, millions of these could be averted as demonstrated in European countries. In the Netherlands, ECs are widely available as a back-up for other family planning methods and consequently it has the lowest abortion rate of any industrialized country.

C. Preventing Unwanted Pregnancies among Adolescents - Many unwanted pregnancies occur during adolescence, when they become sexually active before they are fully aware of the need of contraception or they have had access to appropriate services. ECs can be useful in these situations. An unwanted pregnancy has psychological and health consequences and societal problems.

Socio-economic and cultural factors influence the age at which the young women would have first sexual intercourse and whether they are likely to practice contraception. Thus, the frequency of adolescent pregnancy varies across countries and socio-economic levels. Per 1000 women aged between 15 and 19 years, fertility rate ranges from 54 to 153 in Latin America and from 23 to 236 in African countries. It is the highest with the mean rate of 207 in Central Africa. In contrast, it is below 20 to 30 per 1000 women in developed countries. The rates tend to be the highest among the poor and less educated women.¹⁵

The idea of adolescent sexuality is not accepted in the family, the school or society at large. For this reason, they are not allowed to have education on sex or family life; or even when they are given education this is inadequate considering their real needs. Furthermore, the adolescents do not have proper access to reproductive health care and contraceptive services.

Emergency contraception is useful in preventing unwanted pregnancy in adolescents. There is no evidence to show that the knowledge of this method of contraception encourages sexual activity among young people¹¹. On the other hand, the knowledge and the need of EC may provide stimulus for them to

contact health care personnel, thus providing opportunities for counselling on responsible sexual behaviour, contraception, and prevention of sexually transmitted diseases (STDs) including HIV/AIDS.¹¹

D. Emergency Contraception in Reproductive Health Context - The International Conference on Population and Development (ICPD) held in Cairo¹⁶ in 1994 and the Fourth World Conference on Women held in Beijing¹⁷ in 1995 emphasized the importance of responding to women's needs for reproductive health and family planning. As mentioned earlier in this paper, the concept of reproductive rights should be promoted and the means to fulfill them should be made available and accessible.

At present, unwanted pregnancy is extremely common. Lack of knowledge about fertility and the means to regulate it, lack of power to make decisions about one's sexual and reproductive life, lack of access to contraception, and poor quality of available family planning services are some of the many reasons for this unfortunate situation. Easy access to EC can be of immense help. "By offering emergency contraception information and care, various service outlets can serve as a first contact point where sexually active women, men and youngsters can receive other reproductive health services and counselling and/or referral information. Emergency contraception can thus play an important role in linking individuals and couples to ongoing reproductive health/family planning care".¹¹

TYPES OF EC METHODS AVAILABLE

Several types of oral hormonal preparations and copper-releasing IUD have been used. In 1960s, the first clinical trial of hormonal emergency contraceptive was conducted, using high doses of estrogens. In 1970s, the use of higher doses of combined oral contraceptive pills containing ethinyl estradiol and levonorgestrel (known as Yuzpe method) was initiated. Around the same time, use of high doses of progestogen (levonorgestrel) alone for EC was also started and post-coital insertion of IUD for EC was reported first in 1976. The use of an anti-progestin, mifepriston has been studied more recently.^{11,18}

RATIONAL BASIS AND MECHANISM OF ACTION

The menstrual cycle is regulated by delicately balanced mechanisms involving the hormones secreted by the pituitary (FSH and LH) and ovary (estrogen and progesterone). A normal menstrual cycle of 28-30 days is divided into two distinct phases - a preovulatory follicular phase and the post-ovulatory luteal phase. In the follicular phase, the developing follicles secrete estrogen, the rising titre of which stimulates secretion of LH from the pituitary. The peak level of estrogen leads to LH surge; after about 36 hours of LH surge the

dominant follicle ruptures and ovulation occurs. The ruptured ovarian follicle forms corpus luteum which secretes both estrogen and progesterone. However, a small amount of progesterone is also secreted in the pre-ovulatory period by the luteinized theca cells in the ovary. There is evidence to indicate that this preovulatory progesterone facilitates LH surge.

The sequential and balanced actions of estrogen followed by estrogen plus progesterone are essential for proper functioning of the fallopian tubes and the uterine endometrium. It is important to point out that the estrogen can make its own receptors and thus it can exert direct action. But progesterone cannot make its own receptors, which is formed by estrogen. Therefore, progesterone can act only after proper priming by estrogen.

In normal ovulatory women, ovulation occurs near about midcycle and fertilization takes place in the outer one-third of the fallopian tube within 24 hours. Then the fertilized ovum or zygote undergoes development and is moved towards the uterine cavity; this tubal transport and development takes about four days. By this time the zygote is developed into a blastocyst, and the endometrium is optimally prepared for its implantation by sequential actions of naturally secreted estrogen followed by estrogen and progesterone. Nidation of the blastocyst occurs 5-6 days after fertilization. Depending upon the time in the menstrual cycle when it is administered, the hormonal EC may act by inhibiting or delaying ovulation, or by affecting tubal transport and development of fertilized ovum and/or preventing its implantation in the endometrium which becomes out of phase, mainly by causing hormonal imbalance. The hormonal ECs will not affect a pregnancy that might have already occurred in the earlier part of the menstrual cycle, and will not prevent a pregnancy resulting from a subsequent unprotected sexual intercourse.^{11,18}

The mode of action of IUD for emergency contraception is not precisely known. It is thought to prevent fertilization and implantation; in addition, Cu²⁺ ion has blastotoxic effect. As implantation does not occur before 5 to 6 days after fertilization, copper IUD can still prevent pregnancy five days after unprotected sexual intercourse.

It should be emphasized that none of these methods interrupts a pregnancy and causes abortion.^{11,18}

STANDARD EMERGENCY CONTRACEPTION METHODS AND CURRENT USES:

Several methods have been used as emergency contraceptives which are described below^{11,18-31}.

High Dose Estrogens

This was the first method used in 1960s, and first tried in rape victims. Initially diethyl stilbesterol (DES) was used in a dose of 50 mg daily for 5 days; later on the dose was reduced to 10 mg daily for 5 days. Subsequently, because of potential hazards in female offsprings the use of DES was discontinued¹⁹. Then ethinyl estradiol (EE) was being used in doses of 5 mg daily for 5 days. Using this regimen in one study on more than 3000 women after unprotected coitus, a failure rate of 0.15 per cent was reported. Side effects include nausea, vomiting, dizziness, headache, breast tenderness and irregular bleeding. As the use of high doses of estrogen is associated with greater incidence of side effects, especially nausea and vomiting, it results in failure to complete the prescribed course.

Estrogen-progestogen Combination

Hormonal contraceptives containing EE plus norgestrel or levonorgestrel (LNG) in different dosage combinations may be taken as soon as possible (but not later than 72 hours) after unprotected sex act. This is known as Yuzpe method.²⁰⁻²³ The most widely used regimens are: a) tablets containing EE-50 µg plus LNG-250 µg — two tablets are to be taken as soon as possible after unprotected coitus and this is to be repeated after 12 hours; b) tablets containing EE-30 µg plus LNG - 150 µg, four pills are taken as quickly as possible followed by four more pills 12 hours later, and c) pills containing EE-200µg plus dl - norgestrel 2mg or 1 mg / LNG-1mg, one tablet as the first dose, followed by another tablet after 12 hours. A randomized controlled clinical trial demonstrated that this last method is as effective as high dose estrogen alone.^{18,19}

The side effects of the Yuzpe regimen are comparable to those noted after high-dose estrogen, but their incidence is lower and severity is less. The main side effects are nausea and vomiting in 50 per cent and 20 per cent of subjects respectively, and less common side effects include breast tenderness, abdominal pain, dizziness and headache. Although the side effects are uncomfortable for many women, very few women experience any serious medical problem.

Progestogen - only Pill

Originally, the LNG-only pill (Postinor) was recommended for use at most four times per month. However, this regimen increased the side effects, primarily inter-menstrual bleeding and nausea,¹⁸ and this regimen has been discarded. The current recommendation is that one pill of LNG - 0.75 mg is to be taken as soon as possible after unprotected coitus (within 72 hours), followed by another pill 12 hours later. This method has been found to be highly effective and has

only mild and less frequent side effects.^{24, 25} The side effects of this regimen may be nausea (20%) and vomiting (5%); and other minor side effects include headache and dizziness. The majority of women will have their menstrual period on time or slightly earlier.

After the recent Consortium on Emergency Contraception held in Delhi, this regimen has been chosen as a "dedicated product" and will be available in special package.¹⁴

Anti-progestogen - Mifepriston

One of the most highly effective compounds for EC is Mifepriston (RU-486), a synthetic steroid with anti-progesterone activity; it competes with progesterone for receptor binding. It may alter ovarian follicular maturation, ovulation and possibly fertilization; by accelerating tubal transport of embryo and by interfering with progesterone action on the endometrium it may interfere with implantation. In a earlier comparative study it was reported that with 600 mg single dose RU-486 there was no pregnancy (in 245 subjects), but there were three pregnancies (in 232 subjects) using Yuzpe method. In another comparative clinical trial, a single dose (600 mg) mifepristone proved to be most effective with 0% pregnancy rate. In contrast, with EE + LNG (Ovral) and Danazol (600mg) treatment regimens pregnancy rates were 2.6% and 4.6% respectively.²⁶ Besides its effectiveness, it had no significant side effects. In a multi-centre dose study using 600 mg, 50 mg and 10 mg Mifepriston, there was no difference in pregnancy rates (1.3%, 1.1% and 1.2% respectively).²⁷ The only side-effect was the delay in the onset of menses, which however was less with the lowest dose of the drug.

Intra-uterine Contraceptive Devices (IUD)^{28,29}

Insertion of a copper-releasing IUD as an EC within 5 days of unprotected sex act is highly effective. The major advantage of IUDs over hormonal EC is that this can be inserted until the nidation of blastocyst, somewhat longer time for effective administration. IUDs are advisable for those who are willing to practice long-term contraception and for whom hormonal contraceptives are strictly contraindicated. However, it has some disadvantages: i) these are more expensive, ii) its insertion needs trained doctors or paramedical persons iii) not recommended for patients at risk of STI, or in nulliparous women. The Cu-IUD may prevent fertilization and implantation. It is also blastotoxic/embryotoxic; therefore, in the event of method failure, termination of pregnancy is recommended.¹⁸

TABLE - 1
EMERGENCY CONTRACEPTIVES: FORMULATIONS AND DOSAGE

Formulation per Dose	Common Brand Names	Tablets Needed per Dose	Doses	Timing of Administration
<u>A. Combined-pill Regimen</u>				
1. + EE - 50 µg plus ++ LNG – 250 µg OR	Ovral # Duoluton-L # Neogynon	2	2	First dose within 72 hrs. of unprotected sex. Second dose 12 hrs. later
2. EE - 50 µg plus * NG – 500 µg -----	Ovral-G # Eugynon 50 -----	2	2	First dose within 72 hrs. of unprotected sex. Second dose 12 hrs. later
3. EE - 30 µg plus LNG – 150 µg OR	Ovral-L # Bandhan # Microgynon 30,	4	2	First dose within 72 hrs. of unprotected sex. Second dose 12 hrs. later
4. EE - 30 µg plus NG - 300 µg	Mala-D # Mala-N # Suvida #	4	2	First dose within 72 hrs. of unprotected sex. Second dose 12 hrs. later
<u>B. Progestogen-only Regimen</u>				
LNG 750 µg	Postinor ≠ (Dedicated product in India - Name ?)	1	2	First dose within 72 hrs. of unprotected sex. Second dose 12 hrs. later
Anti-Progestin RU- 486-10 mg	Mifepriston	1	2	First dose within 72 hrs. of unprotected sex. Second dose 12 hrs. later

+ EE = ethinyl estradiol
++ LNG = levonorgestrel
*NG = dl-norgestrel

Available in India
≠ where this is not available, the required number of pills for full doses may be cut out from the combined pills listed above and separately packed for ready use.

OTHER METHODS TRIED

Danazol

It is a synthetic progestin with mild androgenic property; it's previously suspected luteolytic effect could not be substantiated.¹⁸ It has been used for EC by Rowlands³⁰ and the acceptability and effectiveness of different regimens of danazol have been thoroughly studied. Pregnancy rate was 2 per cent among 998 danazol-treated women. However, in a comparative study with other ECs, it was found to have the highest pregnancy rate (4.6%); it had no advantage over

Yuzpe regimen and was of questionable value.²⁶

GnRH-antagonists

Since GnRH-antagonists can dramatically decrease LH secretion and consequently block progesterone production, its application for EC was considered.³¹ However, two major obstacles have emerged: a) preovulatory dominant follicle is not sensitive enough to GnRH-an, and b) it is ineffective in the presence of hCG. Further, it is also very expensive. Therefore, it is very unlikely to be of any value for EC.

Centchroman

This drug was initially thought to have both anti-estrogenic and anti-progestestogenic properties. On this basis it was tried as a post-coital contraceptive, primarily as an anti-implantation agent. Subsequently, it has been conclusively shown that it is a weak estrogen and a relatively more potent anti-estrogen and it competes with estrogen for receptor binding. Per se it does not have any direct anti-progestational property.³²⁻³⁴ Normally, in the pre-and post-ovulatory period, high level of estrogen in the tissues would build up progesterone receptors for full manifestation of progesterone action. Therefore, through the short 'anti-fertility' window available for emergency contraception, a pure anti-estrogen may not be able to interfere with implantation. With this type of pharmacological attribute it is very unlikely to be effective as EC. Any such claim has to be substantiated by randomized controlled studies.

OTHER GENERAL GUIDELINES FOR THE USE OF ECs^{11,18,35}

Eligibility Criteria

There is no known contraindications to the use of hormonal EC, so there is no need for a medical history or a physical examination before providing it. When using an IUD for emergency contraception, the same eligibility criteria would apply as for regular use of these devices. It is not recommended for subjects having pelvic inflammatory disease (PID) or those at risk of STI, or in nulliparous women.

Frequency of Use

EC pills should not replace the use of regular contraception, as the pregnancy rate for frequent use of ECP is higher than regular contraception. However, if unprotected intercourse occurs in a cycle where ECP had already been used, it can be used again, as the earlier used EC cannot protect the possibility of pregnancy from the later unprotected intercourse. The woman must

be made to understand that although ECP may be used again in cycles where repeated unprotected intercourse has occurred, its efficacy may be altered or decreased. Further, if a pregnancy has already occurred, the ECP will not be effective.

Advice and Follow-up

Whenever possible, the woman should get proper counselling at the time of obtaining EC and this would include:

- * Discussion on correct use of the method.
- * Possible side effects and their management.
- * Her preferences for regular contraception; if she is already using any method, to discuss the efficacy and correct use of the method; if not using any contraceptive, she needs to be counselled for making informed choice and continued use.
- * Advice that EC does not protect against STIs including HIV/AIDS and if she might have been exposed to this risk, after assessment of risk she should be appropriately counselled and offered services.
- * She may have to be referred to a family planning or health care facility where she can obtain contraceptive or other appropriate counselling and services in sexual and reproductive health.
- * If the woman has intercourse after taking EC, the risk of pregnancy still exists, as the EC may sometimes alter the timing of ovulation. She should use another method of contraception (eg. condom) for the rest of the cycle after using EC. For switching on to regular contraception with oral pills, she need not wait for next menstrual period, it can be started from the day after the second dose of EC.
- * She should be advised that after ECP, menses would occur within one week before or after the expected time. If menses are delayed for more than one week or if it is much lighter than normal, EC may have failed and she should have a pregnancy test. In the event of pregnancy, she should be counselled and be made aware of available options; after that her decision should be respected and supported. If she decides to continue with pregnancy, she should be reassured that use of hormonal EC would not: (a) affect the future offspring, (b) increase the risk of ectopic pregnancy or (c) affect future fertility. If she decides to terminate pregnancy, she should be assisted.
- * If the woman opts for IUD for emergency contraception, she should be advised that IUD will provide protection against pregnancy for the rest of cycle. Follow-up should be arranged after the expected date of menses to ensure that pregnancy has been prevented and for counselling on regular contraception. She may continue using IUD for long-term contraception, or if she chooses to remove it, this may be done after the onset of menses and she should be offered an alternative method.

Availability and Easy Access to Emergency Contraception

It is very important to ensure that EC methods are readily available and are in easy access to the clients. EC dosage can be taken from supplies of regular oral contraceptives, which are readily available in most places (Table 1). A well-informed practitioner / provider can use this source for providing ECP. With the preparations containing EE-50 µg plus LNG-250 mg or NG-500 µg, two tablets will be required per dose and two doses are to be administered at 12 hours intervals. Alternatively, with preparations containing EE-30 µg plus LNG-150 µg or NG-300 µg, four tablets will be required per dose and two doses are to be taken at 12 hours intervals. Availability of specially packaged ECP is increasing rapidly around the world, and recently the Government of India has chosen the progestogen – only pills containing two doses of 0.75 mg. Levonorgestrel (LNG) as such “dedicated product”. This will be soon marketed by drug companies. Service providers should be trained in the correct use of these ECPs and in the counselling and follow-up of clients.

As the EC should be used as soon as possible after unprotected intercourse, every effort should be made to ensure that women know about EC and have ready access to it. This can be accomplished by:

- a) Disseminating information on EC and how to obtain it.
- b) Including EC in the focus of education of women receiving services for contraception or sexual and reproductive health.
- c) Providing ECPs at clinic and non-clinic settings such as community-based services, social marketing and commercial drug stores.
- d) Giving special attention to EC for sexual and reproductive health programmes for adolescents and youths.

Increasing Awareness and Sensitivity: Removing Misconceptions

There is lack of awareness and great paucity of knowledge regarding ECs not only among the general public and prospective clients, but also among the service providers and professionals including the gynaecologists and general practitioners. There is an urgent need for properly sensitizing all sections of people through appropriate IEC programmes. While doing this, special attention needs to be given to identify the barriers, particularly the myths and misconceptions and to effectively counter or remove these. The common misconceptions are stated below and there is no valid basis for these.¹¹

- 1) *Emergency contraception (EC) is a form of abortion.*
 - This is not so. ECs do not displace an implanted embryo, and cannot terminate an established pregnancy.

- 2) *EC promotes irresponsible and / or promiscuous sexual behaviour.*
 - There are no data to suggest this. On the contrary, EC can act as a bridge to contraceptive information and counselling for regular use and as an opportunity to provide information on prevention of STDs and HIV / AIDS.
- 3) *EC is targeted mainly at unmarried adolescents and may undermine parental authority and community morals.*
 - This is not correct. Women of all ages, including the adolescents, may need EC. However, young women with little knowledge and experience are at specially high risk of an unwanted pregnancy, and preventing pregnancy in adolescents is a high priority in all countries.
- 4) *Women or couples may stop using regular contraception if EC is easily available.*
 - The clients are to be told clearly that EC is meant for "emergency" situations only. If ECP is used repeatedly, compared to regular hormonal pills, it is less effective, and produces more unpleasant side effects such as nausea and vomiting, exposes women to higher hormone load, and ECPs are more expensive.
- 5) *Men may be less willing to use condoms if they know that their partners can use EC.*
 - Couples are to be told that use of condoms serves a dual purpose - prevention of pregnancy and transmission of disease. EC does not protect against STDs and HIV/AIDS. EC is available as a back-up in case condom breakage and slippage.

PROGRAMME INTRODUCTION OF CONTRACEPTIVES/ ECs:^{36,37}

Before considering introduction of any new method including emergency contraceptives in a mass programme, various factors and issues which affect contraceptive acceptance, practice and continuation rate need to be considered seriously. Experience gained from clinic-based trials is not adequate from the point of programme operations. Many other factors which do not exist in well controlled clinical trial situation become crucial for success in a mass programme. Without careful planning and preparation, the new methods may be poorly accepted and the dropout and pregnancy rates may be unacceptably high. This in turn may also damage the reputation of the family-planning programme. After proper planning and preparation, the method may be introduced in a limited scale at first, and on the basis of the experience gained it may be introduced into other areas in an incremental fashion.

Factors Influencing Acceptance and Continued Use of Contraceptives³⁶

The acceptability of any contraceptive in a community can be judged by its continued use. This is influenced by various factors such as (1) the intrinsic character of the method, (2) individual and social acceptability, (3) providers' knowledge, skill, attitude and credibility, (4) effective communication, (5) appropriate delivery system, and (6) cost.

Intrinsic Character of the Method - The intrinsic characters of a particular method, which affect the acceptance and continuation rate etc., are (a) medical safety, (b) effectiveness, (c) side-effects, (d) ease in continuity of use, and (e) easy reversibility. The programme personnel and the health and family planning field staff should be well versed with these aspects for carrying out their functions properly in terms of educating, motivating, guiding, serving and counselling the prospective and current users.

Individual and Social Acceptability - Acceptability is a quality which makes the object or idea attractive, satisfactory, pleasing and adaptable. Acceptability centres around perception of an innovation based on clusters of perceived attributes. In carefully conducted studies, ideally involving a combination of survey research and measures of actual behaviour; some prediction of the types of acceptors, rate of acceptance, and rate of continuation for method should be possible. Circumstances surrounding acceptance can also be identified.

From different studies, important specifications for individual and social acceptability of contraceptive methods have been identified. These are: (a) socio-economic development status; (b) cultural values, perceptions and practices in regard to menstruation and its alterations, small family norm, contraception etc; (c) nature and type of the contraceptive need; (d) accessibility and credibility of the service giving agency; (e) past experiences; (f) whether the method is to be used by male or female partner; (g) duration of effectiveness; (h) probability and ease of reversibility; (i) to be used during coitus or not; (j) mode of administration i.e. oral, local or surgical; (k) frequency of use; (l) safety and side effects; (m) contraceptive effectiveness; (n) need for continued motivation; and (o) peer and spouse's approval of the method.

By establishing proper rapport with the community, a proper assessment of these aspects may be made. If necessary, a short diagnostic survey may be helpful. For example, one should find out why in some sections of the population there is low acceptance of family planning.

For promoting acceptability, the leaders in the community may be contacted and be involved in the programme. The objectives and the benefits of

the programme are to be explained and their cooperation is solicited. If there are existing participatory organisations such as Village Health Committees, Mothers' Clubs, Youth Clubs, NGOs, women's organisations etc., they may be involved. Elected representatives of the area may also be approached.

Satisfied acceptors of family planning may be effectively utilized for promoting social and individual acceptability. It should, however, be remembered that satisfied users would not necessarily disseminate their positive experience, but the dissatisfied acceptors are more likely to spread their adverse reactions. Therefore, it is also very important to make all efforts to reduce the number of dissatisfied users and to take measures to satisfy them.

Providers' Knowledge, Skill, Attitude and Credibility - The knowledge, skill and attitude of the providers, may they be the physicians or non-medical health auxiliaries, play very important role in the acceptance and continued use of contraceptives. From the field experience it is noted that many a times the doctors and the paramedical staff lack proper knowledge, skill and faith or confidence in particular methods. Under the circumstances, they cannot educate and motivate the clients properly; neither can they allay the fears and doubts and provide reassurance. This points out the great importance of education, training and motivation of service providers.

The goal of the field staff would be (i) to supply necessary information for education and motivation; (ii) to assist the clients to evaluate contraceptive information and services, and to make an informed choice and decision about these; and (iii) to encourage them for continued practice. Use of appropriate visual aids helps the process of communication and proper comprehension. They should explain the advantages and disadvantages of all the methods to the prospective clients and leave the final choice of the method to the clients. If the decision on the choice of method is made by the user, and particularly by the husband and wife together, the possibility of their continuing with the method would be greater.

While appraising the clients about the advantages of particular methods as well as the possible side effects, they should neither build unusually high expectations nor cause undue doubts, fear or apprehensions. They may emphasize that side effects do not occur in all individuals. Further, these are often mild and transient, and these may decrease or disappear with continued use. Nevertheless, they should reassure the clients that in case of any problem they would receive medical attention and care; in rare situations where the method is found to be not suitable for a particular individual, it would be withdrawn and an alternate method will be provided.

The health and family planning workers should develop proper

communication and counselling skills. While securing effective communication in family planning, they should assure and reassure the clients. They should also be able to recognize signs of various barriers and simultaneously avoid developing barriers. Similarly, they should also be alert to detect rumours and effectively counteract these.

During their training, the health personnel not only must learn the theoretical and practical aspects of all the methods including their relative merits and demerits, the psychological support and follow-up-care needed by the acceptors, but they should also develop proper attitude and faith and commitment in the family planning programme.

During the training period the field staff should be guided to develop talking points for education, motivation and follow-up of acceptors - both in the clinic and the field. They should be given a simple technical paper prepared in the form of questions and answers related to the use of contraceptives, to help them answer queries in the field.

A practical way of preparing the above mentioned talking points as well as the questions and answers would be to get a feedback from the currently working health and family planning field staff, particularly the health workers (female), on the type of problems they face and the type of the questions they are asked in their family planning work; to analyse these and then prepare a need-based material.

The field staff should be provided with appropriate educational aids and also checklists for selection of acceptors of various methods such as IUCD, oral pills, etc.

The health and family planning personnel should develop skills for working with the community and encouraging their interest, enthusiasm, involvement and participation. They should be able to identify and satisfy some of their perceived needs, which will help in establishing their credibility within the community.

Effective Communication and Motivation- Education and motivation of the people normally proceed through four phases - (i) *Sensitization* i.e. creating an awareness and interest; (ii) *Education* i.e. further information gathering and evaluation for decision making; (iii) *Motivation* i.e. making decision for adoption and trial or experimentation; and finally; (iv) *Practice* i.e. adoption and continued use.

Mass communication through exhibitions, hoardings, posters, leaflets, newspapers, magazines, films, television programmes and radio talks etc. are

very helpful for sensitizing the community and creating an awareness and interest in family planning and contraceptive methods and also for allaying any adverse public opinion. However, communication through these mass media may reach and influence the couples to a limited extent. For further strengthening this education process and ultimately motivating the couples to accept and practice family planning, group communication and interpersonal communication play the most crucial role. It is in these latter types of communication process where the field staff have to perform a major role. Obviously, therefore, there is an urgent need for strengthening their communication skills.

For educating the community and motivating the individual couples, systematic, coordinated and complementary use of mass media, group orientation and interpersonal communication would be very important. It is also necessary to choose the means of communication appropriate to the local resources and the messages to be delivered.

Except for certain cultural differences, the family planning messages to the clients and to the people in the community are fairly standard from one place to another and from one country to the other. The messages are usually on: what is family planning, why family planning, what are its benefits and what are the hazards of not accepting it; how to achieve family planning, where and when to obtain advice for clinical services or material etc; who is to provide necessary advice and guidance, and what is his/her competence.

The nature of the messages will vary with different target groups and with the different approaches or the media used. Findings of any audience research survey and other relevant research studies will be helpful in constructing specific and effective messages.

Even for the female method, the husbands should be contacted and educated and taken into confidence. Private practitioners and other medical and para-medical persons of the locality should be oriented and educated. Considering the important role-played by the family physicians in the decision making of many families, every opportunity should be taken to supply the necessary literature to them and to create in them a genuine interest.

For carrying out meaningful and effective education and motivation programmes, appropriate educational materials and educational aids are to be prepared.

Appropriate Contraceptive Delivery System - This should take into consideration the easy accessibility; logistics of procurement, storage and supply; technical competence of the providers; physical and monitoring facilities;

and technical and administrative capability of the agency for organization and management of the contraceptive delivery programme.

Effective delivery of contraceptive services at doorsteps of the people is considered to be an important measure for promotion of small family norm. The channels through which the contraceptives are to be made available to the people in the community can be considered under three main groups; (i) through health services infrastructure and health functionaries; (ii) through private agencies, non-governmental organisations including voluntary organisations, and social marketing and (iii) through commercial channels.

From the available experience, the following general observations may be made: (i) Methods difficult to teach or use are least likely to succeed. Potentials for misuse of even the simplest means of fertility control are often under-estimated or misunderstood. Errors in use are responsible for high rate of failure. (ii) With the methods requiring repeated application, it is often difficult to maintain supply of contraceptives to target population. On the other hand, methods requiring one time use or periodic use have many operational advantages. Thus, the intrauterine devices, hormonal injectables and implants and sterilisation have advantages over other methods. However, it may be pointed out that for IUDs, injectables and implants adequate follow-up would be necessary. (iii) Physician-based services, other than one-time methods are usually unrealistic for population in developing countries. Western style health care system, through which contraception services are being delivered, is largely inaccessible to couples. (iv) Use of community workers, para-medical auxiliary staff, indigenous health workers, commercial distribution system are more practicable. Community-based distribution or social marketing can be best utilized among rural population in developing countries.

Cost - The cost of contraceptives sold in commercial sector is out of reach of the majority of people. This may become an important barrier to contraceptive use and self-sufficiency. Original costs and re-supply costs must be considered for new technology.

The safest, most effective and most acceptable means of fertility control will do little good, unless it can be offered to potential clients in a consistent, affordable and convenient fashion. Low cost, simple and ease of delivery by indigenous programme workers are some of the important virtues of contraceptives.

PROBLEM OF TRANSFER OF TECHNOLOGY FROM THE CLINIC TO THE FIELD

Transfer of contraceptive technology which has been developed and

tested in a controlled environment of the clinics to open society in the field is a complex process; because, in a field situation many other factors, which did not exist in clinic environment, become crucial in the acceptance and continued use of contraceptives. To be successful, it would be important to make the technology suitable or adaptable to the culture of the people and capabilities of the service system. At the same time, the people in the community have to be properly educated to make them receptive and the service system should be appropriately strengthened. It would be absolutely essential to develop appropriate methodology and guidelines for introduction of contraceptives in the field and undertaking operational studies by a competent multi-disciplinary group. This group should include clinical expert, social scientist, operations research specialist, trainer and educator, programme officer and administrator. Initially, such study may be undertaken in a limited area, and with gaining of experience it can be extended to other areas in an incremental fashion. While designing operational study, factors, which affect the acceptability and continuation rate of contraceptives, as enumerated earlier, must be taken into consideration. *In fact, for successful programme introduction of any new contraceptive and even for promotion of existing methods, similar approach should be followed.*

PROGRAMME INTRODUCTION STEPS

Approach and Administrative Arrangements - Introduction of contraceptives in a mass programme requires technical skills, proper follow-up, logistics of procurement, storage and supplies, and proper coordination among health personnel and various agencies/organisations. Strategically, it would be important to initiate the programme in collaboration with some district hospitals having active post-partum programme (PPP). A trained gynaecologist is incharge of the PPP in district hospitals. An Urban Family Welfare Centre along with the medical officer and other staff is attached to this PPP centre. In addition, some Primary Health Centres (PHCs) are also under direct supervision and control of this centre. Important strategy would be to initiate the programme in the urban area with the assistance of the Urban Family Welfare Centre. After gaining experience with the delivery of contraceptives, the programme may be extended to the PHC under the control of the PPP Centre. Subsequently, the programme may be extended to other district hospitals with post-partum programme in an incremental fashion. The whole programme is to be organised with an operational study approach.

After the selection of the district hospital, the State and District health authorities are to be contacted and apprised of the proposed operational study which would be followed by introduction of contraceptives in mass programme. The objectives of the study and the collaboration and assistance needed are to be explained. The details of plan of action are also to be discussed.

Preparation of the Community- The community leaders are to be identified and contacted. The purpose and the advantages of the contraceptive programme are to be explained and their cooperation is solicited.

Based on the available information, appropriate “information, education and communication (IEC)” programme should be planned. The type of the message to be communicated to the individuals and the community has to be determined. The IEC programme, which has to be sustained, should be initiated prior to introduction of contraceptives and vigorously pursued during the programme implementation. Special educational and motivational campaigns are to be launched. For such mass programme, promotional strategy would be most vital to maximise acceptance. Proper educational material and aids are to be developed for mass communication as well as for group and inter- personal communication.

Doubts and misconceptions regarding menstruation, contraceptives etc. should be removed and favourable attitudes are to be created. Transfer of value system should be done gradually and tactfully. Support of the private practitioners, other health functionaries and voluntary agencies is also to be ensured.

Preparation of Service Agency -The objectives of the operational study and the plan of action are to be laid down. Background materials including manuals are to be prepared for the education and training of the doctors and paramedical staff. These should include the details of the delivery system, operational directives, product information, educational aids in the form of films, slides, flip charts, talking points etc.; check-lists for individual screening of clients by paramedical staff; guidelines for management such as follow-up schedules, list of possible complications and their managements etc. Arrangements for proper record keeping and reporting are to be made.

Logistics of procurement and supply should ensure continued regular supply of contraceptives, pregnancy test kits etc. Mobility of the staff for proper follow-up would be very important.

The PPP Centre should have proper facilities for medical termination of pregnancy (MTP).

Orientation and Training of Doctors and Paramedical Staff³⁸ - This training course is to strengthen the knowledge and skill of the doctors for the common gynaecological disorders, proper education, motivation and selection of clients, technical aspects of contraceptives including management of complications. They should be trained properly for organising, implementing and evaluating field trials in their respective areas. Stress should be laid on the need of their

realising the importance of various factors, which influence contraceptive acceptance and practice. Developing a proper attitude and faith in contraceptives would be very important. It should also be impressed upon them that psychological preparation of the couple, and specially of the woman, as well as involvement of male partners would be vital. They should be well oriented to proper counselling techniques.

Since the paramedical staff has to provide an important supportive role, their training is of paramount importance for the sustenance of the programme. They would be involved in education, motivation and preliminary screening of the clients, and follow-up services including proper counselling and provision of psychological support. The aim of their training would be to provide appropriate knowledge and develop proper skill and attitude. All these have been discussed in details earlier in this paper.

The designing and conduction of training courses should be based on educational technology guidelines.

Screening and Follow-up of Clients by Paramedical Staff - The initial screening of the prospective clients and provisional selection will be done by paramedical staff with the help of a checklist. Final selection would be done by the gynaecologist/trained medical officer. During the follow-up carried out by the paramedical staff, if there is any problem the clients are to be reassured and the matter is to be brought to the notice of the doctors. Appropriate corrective measures would be taken. The process continues.

Monitoring and Control of the Programme - For regular monitoring and control of the programme there should be proper record keeping and reporting system. The coordinator should regularly visit the participating hospitals and centres for getting a feed back, as well as for providing technical guidance and support wherever needed.

Assessment of the Programme - The programme will be assessed periodically, and if there are any problems corrective measures are to be taken. There should be an in-built mechanism for evaluation of the process as well as the impact and for proper feed back enabling gradual improvement of the programme.

Extension of the Programme to the Rural Areas - Once the programme in the urban area is stabilised and with the availability of the experience the programme will be extended to the primary health centres (PHCs) attached to the PPP centres. Subsequently, with gaining of further experience the programme will be extended to other districts and PHCs to make it a mass programme.

CONCLUSIONS

The high incidence of unwanted pregnancy and unsafe abortion in developing countries including India is mainly a reflection of unmet need resulting from inadequate or poor implementation of reproductive health care, particularly the contraceptive promotion and delivery programme. In spite of the high effectiveness of modern contraceptives, large number of unwanted pregnancies occurs throughout the world and many seek termination.

If emergency contraceptives (ECs) were easily available, millions of these could be averted as demonstrated in European countries. In the Netherlands, ECs are widely available as a back-up for other family planning methods; as a consequence this country has the lowest abortion rate even among the industrialized countries.

There is an urgent need for introduction of ECs in India as a back up for other family planning methods, the use of which needs to be promoted. A 'dedicated brand' of EC would soon be marketed in India. However, in the absence of any dedicated product, the required doses can be cut out from the currently available combined hormonal pills and used as EC. Systematic steps for the introduction of EC and the overall strengthening of the contraceptive programme have been described in this paper. Concerted efforts are to be made by all concerned for successful implementation of this crucial component of integrated reproductive health care programme.

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UNWANTED PREGNANCIES/BIRTHS AMONG ADOLESCENTS IN TWO MINORITY GROUPS IN MAHARASHTRA

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ABSTRACT

In this paper, an attempt has been made to examine and understand the dynamics of unwanted pregnancies/births among adolescents in two minority communities in Thane district of Maharashtra. In addition, this paper correlates the relationship between unwanted pregnancies/births were about 20 per cent, consisting of mistimed 19 per cent and never wanted one per cent. On the other hand, among Muslims, it was only 10 per cent, consisting of mistimed 7 per cent and never wanted 3 per cent.

Key-words: Mistimed, Adolescent, Events

The period of adolescence (aged 15-19 years) that encompasses the transition from childhood to adulthood which is the most vulnerable and crucial stage of life because during this period many key social, economic, biological and demographic events occur that determine the future course in adulthood¹. According to the population projection carried out by the Registrar General of India, there are about 105 million adolescents in India in 2000 of which 56 million are boys and 49 million are girls². Further, of the total of 49 million adolescent girls in India, nearly 15 million are married and more than 3 million have already become mother. As per the National Family Health Survey (1998-99), adolescents contribute nearly 20 per cent to the total fertility at the national level.³

There are about 9.4 million of adolescents in the State of Maharashtra of which 5 million are boys and 4.4 million are girls². Nearly 2 million of the adolescent girls in the State become mother before reaching 20 years of age. We do not have any information on the number of adolescents sexually active either

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in India or in Maharashtra. Although millions of adolescents are sexually active within the institution of marriage but they have either no or very little decision-making role about their own reproductive life. It is largely controlled by various community norms or by household members especially mother-in-law and husband. Contrary to the general belief, a large number of adolescents do not want to have child early in life. However, lack of knowledge of family planning methods as well as poor accessibility to required services force them to have a child at an early age.

The analysis of data for various countries carried out by Singh reveals that among Asian women aged 15-19 years who had a birth in the past five years preceding the survey date, percentage of unwanted or mistimed births varied between 18 per cent in Thailand (1987), 22 per cent in Bangladesh (1993-94), 30 per cent in Sri Lanka (1987) and 32 per cent in Philippines (1993)⁴. The National Family Health Survey (1992-93) reveals that in India about 18 per cent of the total births to the adolescents were either unwanted or mistimed. In case of Maharashtra, the extent of mistimed birth among adolescents was about 18 per cent and never wanted was about 1.5 per cent. In a society like ours, where majority of the marriages continue to take place among adolescents without their consent. The first birth of the married woman gives her recognition in the society as well as in the household. Therefore, reporting of the unwanted pregnancy or birth has much large implications as well as consequences. This issue would be more serious among the adolescents belonging to the under-privileged group of the population where status of women is that of subordination and programme accessibility (economic, social and physical is very poor).

The present paper examines the dynamics of the unwanted pregnancies/births (both never wanted and mistimed) among the Tribal and Muslim adolescents in Thane district of Maharashtra. The paper also attempts to find out the relationship between unwanted pregnancies/births and woman's literacy, mass media exposure and her decision-making power in the households.

MATERIALS AND METHOD

The analysis in the present paper is based on the sub-set of data of a larger study entitled "Socio-economic and Demographic Determinants of Unwanted Pregnancies/Births in Tribal and Muslim Areas of Maharashtra" conducted by the author.⁶ The survey was carried out in four Community Development Blocks of Thane district in Maharashtra during the year 1999.

A total of 32 primary sampling units, 8 from each of the four selected community development blocks, were selected, using probability proportion to the population from the 1991 census which served as the base population for the village selection. On the other hand, for selecting the urban wards in Thane and

Bhiwandi, first the wards with larger share of Muslim population was identified with the help of Municipal Corporation Office, Thane. After identifying all the wards with larger share of Muslim population, (above 70 per cent) 8 wards from each of the blocks were selected, using a similar procedure. Thus, the Tribal adolescents from the 16 villages spread in the community development blocks of Jawahar and Mokhada and Muslim adolescents from the 16 Muslim dominated urban wards of community development blocks of Thane and Bhiwandi constituted the sample. The sample size was fixed at 2600 eligible women (650 each from four selected blocks). The eligible woman for the present study was one who is in the age group of 15-44 years and is currently married and had at least one delivery and/or pregnancy between January 1995 and the survey date. It may be mentioned here that in the following text we shall refer to the Tribal blocks as J-M blocks and Muslim blocks as T-B blocks. Further, pregnancy/birth will be referred to as an event.

Among the sample of 2600 eligible women covered in the present study, there were 4319 events that took place during the four years preceding the survey date. Out of the 2600 eligible women interviewed in the present survey, 821 were adolescents aged 15-19 years (630 from J-M blocks and 191 from T-B blocks). The 821 adolescents experienced 1080 events during the reference period (866 in J-M blocks and 214 in T-B blocks). This forms the sample size for the present analysis. For better understanding of the issues involved, the analysis has been carried out in the present paper separately for early adolescents (aged 15-17 years of age) and late adolescents (18-19 years of age).

FINDINGS

Table 1 gives selected household characteristics that indicate the socio-economic status of the adolescents. As one can see, there are very clear-cut differences in the two types of households. In T-B blocks, safe drinking water, electricity and sanitation facilities are available to most of the households. On the other hand, majority of the households in J-M blocks are deprived of these basic needs. For example, safe drinking water is available to less than 5 per cent of the households in J-M blocks and over 92 per cent of them do not have any type of sanitation facility. Only about one-third of the households in J-M blocks use bulb for lighting. Though, majority of the households in both types of blocks live in one-room houses, separate room for kitchen is available to only about 60 per cent of them. Majority of the respondents in J-M blocks live in kachcha houses whereas in case of T-B blocks, most of the houses are either pucca or semi-pucca. It may further be noted that in the tribal blocks, wood is more commonly used as fuel for domestic cooking whereas in Muslim blocks, it is LPG and kerosene.

TABLE 1
DISTRIBUTION OF THE SURVEYED HOUSEHOLDS BY DRINKING
WATER, LIGHT, SANITATION, ROOMS, FUEL AND HOUSE

Characteristics	J-M Blocks	T-B Blocks
(i) Main Source of Drinking Water		
Tap	4.6	100
Well	92.5	0.0
River	2.9	0.0
(ii) Source of Light		
Oil Lamp	60.3	0.5
Electric Bulb	39.7	99.5
(iii) Sanitation Facility		
No facility	92.1	0.0
Common Latrine	1.9	78.0
Flush	6.0	22.0
(iv) Number of Rooms		
One	93.5	90.6
Two	5.6	7.9
Three or more	0.9	1.5
(v) No Separate Room for Kitchen	59.5	62.8
(vi) Fuel Used for Domestic Cooking		
Kerosene	0.6	71.2
LPG	0.0	28.8
Wood/others	99.4	0.0
(vii) Type of House		
Pucca	7.8	36.6
Semi-Pucca	15.1	46.1
Kachha	77.1	17.3

The literacy level of adolescents, mass media exposure and their decision-making power in the household given in Table 2 reveal that adolescents literacy is very low in J-M blocks (21%) as compared to T-B blocks (60.2%). However, among the literate adolescents about 43 per cent of the adolescents in Tribal areas and nearly 37 per cent in Muslim areas reportedly read newspaper

or magazine at least once a week. A rather lower proportion of the adolescents in the J-M blocks had been exposed to either Television or Radio (only 9-10 per cent of them watched television or listened to Radio at least once a week). On the other hand, the share of adolescents exposed to these two forms of media is much higher, ranging between 59 and 62 per cent in T-B blocks. This may be probably due to the geographical proximity of these wards to the Greater Mumbai. Very few of the adolescents in both types of blocks reportedly go to cinema hall for watching movie.

TABLE 2
DISTRIBUTION OF THE SURVEYED ADOLESCENTS BY LITERACTY,
MEDIA AND DECISION-MAKING POWER

Characteristics	J-M Blocks	T-B Blocks
(i) Per cent literate	20.6	60.2
Among literate, read newspaper/magazine Once a week	43.1	36.5
(ii) Per cent exposed to any type of mass media	17.5	84.3
Listen to radio once a week	10.3	59.2
Watch television once a week	9.4	61.8
Go to cinema theatre once a week	2.9	5.2
(iii) Adolescents with		
High decision-making power	36.5	27.2
Medium decision-making power	60.6	33.5
Low decision-making power	2.9	39.3

Table 3 gives the results of the status of the pregnancy/birth among the adolescents in terms of whether they wanted or not. In the early adolescent group (15-17 years), of the total 457 events in the Tribal adolescents blocks, 16.2 per cent were unwanted. It may be mentioned here that the age at marriage for girls in J-M blocks was extremely low and those who marry early probably do not want to have child immediately after marriage. The findings also indicate that the health workers have no contact with the adolescents. The unwanted events are higher in PHC and sub-centre villages as compared to the villages where these facilities are not available. On the other hand, out of the total of 214 events among the adolescents in T-B blocks during the reference period, the early adolescent group in Muslim areas had only 21 events. Of these 21 events, about 5 per cent was never wanted. The age at marriage for girls was comparatively high in T-B blocks.

TABLE 3
DISTRIBUTION OF THE EVENTS BY WANTEDNESS STATUS*

Characteristics	J-M Blocks	T-B Blocks	Total
(i) Early adolescents (15-17 years)			
Wanted at that time	83.6	95.2	84.1
Wanted later (mistimed)	16.2	0.0	15.5
Wanted no more (never wanted)	0.2	4.8	0.4
Total number	45.7	21	478
(ii) Late adolescents (18-19 years)			
Wanted at that time	76.3	89.1	80.4
Wanted later (mistimed)	21.8	7.8	17.3
Wanted no more (never wanted)	2.0	3.1	2.3
Total number	367	193	560
(iii) Adolescents (15-19 years)			
Wanted at that time	80.1	89.7	82.0
Wanted later (mistimed)	18.8	7.0	16.5
Wanted no more (never wanted)	1.0	3.3	1.5
Total number	844	214	1038

For 42 cases in J-M block age break-up is not available and for 5 cases in T-B block age break-up is not available.

Out of the total of 367 events among late adolescents in J-M blocks, about 24 per cent was unwanted (22 per cent mistimed and 2 per cent never wanted). On the other hand, the corresponding figure in T-B blocks was only about 11 per cent (7.8 per cent mistimed and 3.1 per cent never wanted). This type of pattern may emerge due to low age at marriage where woman may achieve second or third parity at a relatively young age.

High level of unwanted pregnancy/birth among adolescents belonging to underprivileged population in Maharashtra does indicate the need for an effective strategies that encourage to delay the marriage and make family planning methods, especially spacing methods, easily accessible to the young couples. It may be noted that the tribal adolescents have very little knowledge of spacing methods of family planning, IUD 22 per cent, Condom 13 per cent and Oral Pills 53 per cent. Contrary to this, the knowledge of family planning methods (both terminal and spacing) was universal among Muslim adolescents. The preference for Oral Pills was significantly high among Muslim adolescents but their availability at the household level was very poor⁷.

Table 4 reveals that among adolescents in T-B blocks no significant difference was observed by educational status. However, the per cent of never wanted events was higher among literate adolescents as compared to the illiterate adolescents.

TABLE 4
DISTRIBUTION OF THE EVENTS BY WANTEDNESS STATUS AND AGE
AND EDUCATION OF THE ADOLESCENTS*

Characteristics	J-M Blocks		T-B Blocks	
	Illiterate	Literate	Illiterate	Literate
(A) Early adolescents (15-17 years)				
Wanted at that time	86.3	70.1	100.0	92.3
Wanted later (mistimed)	13.0	29.9	0.0	7.7*
Wanted no more (never wanted)	0.3	0.0	0.0	0.0
Total unwanted	13.3	29.9	0.0	7.7
No. of cases	370	87	8	13
(B) Late adolescents (18-19 years)				
Wanted at the time	78.0	59.2	89.6	88.3
Wanted later (mistimed)	19.6	40.8	7.8	8.1
Wanted no more (never wanted)	2.4	0.0	2.6	3.6
Total unwanted	22.0	40.8	10.4	11.7
No. of cases	291	76	77	111
(C) Adolescents (15-19 years)				
Wanted at that time	82.9	56.4	90.6	88.7
Wanted later (mistimed)	15.9	43.6	7.1	7.3
Wanted no more (never wanted)	1.2	0.0	2.3	4.0
Total unwanted	17.1	43.6	9.4	11.3
No. of cases	661	163	85	124

*Based on only one case out of the total 13 cases in this group.

**For 42 cases in J-M block age break-up is not available whereas for 5 cases in T-B block age break up is not available.

In J.M. block, unwanted pregnancies were more amongst literate than the illiterates while in T.B. block except for early adolescents (15-20 years) unwanted pregnancies were more amongst literate. In case of the other two groups viz. late adolescents and adolescents, no significant difference was observed between the illiterate and the literates with regard to unwanted pregnancies. Overall the percentage of unwanted pregnancies were more in J-M blocks than in T.B. blocks.

Table 5 indicates the unwanted events by the decision-making power. Virtually there was no difference in the level of unwanted events in both the areas. But the serious concern was the higher per cent of late adolescents reported never wanted pregnancy/birth.

TABLE 5
WANTEDNESS STATUS OF PREGNANCY/BIRTH BY AGE AND
DECISION- MAKING POWER*

Age	Status	J.M. Blocks			T.B. Blocks		
		Low	Medium	High	Low	Medium	High
15-17 years	Wanted that time	100	84.7	80.4	83.3	100	100
	Mistimed	-	14.9	19.6	0	0	0
	Never wanted	-	0.4	0	16.7	0	0
	Total cases	13	281	16.3	6	10	5
18-19 years	Wanted that time	61.5	69.9	81.9	90.5	86.9	88.7
	Mistimed	38.5	26.9	18.1	8.1	4.9	11.3
	Never wanted	-	3.2	-	1.4	8.9	-
	Total cases	13	216	138	74	61	53
15-19 years	Wanted that time	80.8	78.3	81.1	88.7	88.7	89.7
	Mistimed	19.2	20.1	7.5	4.2	4.2	10.3
	Never wanted	0.0	1.6	2.5	2.5	7.1	0.0
	Total cases	26	497	80	80	71	58

*For 42 cases in J-M block age break-up is not available and for 5 cases in T-B block age break-up is not available.

In J.M. block the unwanted pregnancies were more amongst adolescents exposed to mass media. In T.B. block, 15-17 years of age group which exposed to mass media showed more unwanted pregnancies. The other groups did not show much difference in unwanted pregnancy between the exposed and unexposed to mass media (Table 6).

TABLE 6
WANTEDNESS STATUS OF PREGNANCY/BIRTH BY AGE AND
MASS-MEDIA EXPOSURE

Age	Status	J-M Blocks		T-B Blocks	
		Blocks Exposed	Not Exposed	Not Exposed	Blocks Exposed
15-17 years	Wanted that time	84.1	80.8	100	94.7
	Mistimed	15.6	19.2	0.0	0.0
	Never wanted	0.3	0.0	0.0	5.3
	Total cases	384	73	2	19
18-19 years	Wanted that time	78.1	55.4	87.9	89.0
	Mistimed	20.2	41.5	12.1	7.1
	Never wanted	1.7	3.1	0.0	3.9
	Total cases	302	65	33	155
15-19 years	Wanted that time	81.5	68.8	88.6	89.7
	Mistimed	17.6	29.7	11.4	6.3
	Never wanted	0.9	1.5	0.0	4.0
	Total cases	686	138	35	174

*For 42 cases in J-M block age break-up is not available whereas for 5 cases in T-B block this is so.

TABLE 7
RESULTS OF LOGISTIC REGRESSION

Variables	Reference Category	Beta	Significance	Exp (B)
Community Development Block	T-B Block	-1.178	0.000	0.30
Women Education	Illiterate	-0.811	0.000	0.44
Mass Media Exposure	Not Exposed	-0.096	0.691	0.909
Decision Making	Low	0.578		
Medium		0.085	0.816	1.08
High		0.182	0.297	1.20
Constant		-0.814	0.000	0.44

Note: 0-Wanted that time, 1-Unwanted

'Unwanted pregnancy/birth' is the dependent variable whereas woman's education, exposure to mass media, decision-making power of women in the household and community development blocks are the independent variables. Significant difference was observed in reported unwanted pregnancy/birth by community development block and women's education. The tribal adolescents are more likely to report unwanted pregnancy/birth. Further, illiterate adolescents have reported higher unwanted pregnancy/birth. Decision-making power of women in the household does play a role but it was not significant (Table 7).

CONCLUSION

Analysis indicates that tribal adolescent had about 20 per cent unwanted pregnancy/birth whereas it was only 10 per cent in Muslim adolescents. In Tribal area, age at marriage is comparatively low and those who marry early do not want to have child immediately. Every effort should be made to enhance the contact of health workers with adolescents not only in tribal area but also in the Muslim area. Oral pills are very popular among Muslim but accessibility is very poor. These adolescents must be provided Pills at their doorsteps.

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STATUS OF ANTE-NATAL COVERAGE IN FOUR STATES

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ABSTRACT

This paper presents a clear-cut picture of antenatal care (ANC) services in four States namely, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh. The findings of the study reveal that only 35 per cent of mothers from a total of about 6,150 mothers from 900 villages of 30 districts had received the full package of ANC services in comparison to 53 per cent at the all India level. It has been observed in the study that literacy of women has been found to play a key-role in the utilization of ANC. To increase the coverage of antenatal care in the States under study, the authors suggest information, education and communication (IEC) which will help mothers to understand the importance of immunization.

Key-words: Cluster survey, Booster immunization.

The Department of Family Welfare, Ministry of Health and Family Welfare, Government of India, requested the Indian Council of Medical Research (ICMR) to undertake the Coverage Evaluation Surveys (CES) for Universal Immunisation Programme (UIP) in all the States and Union Territories. Earlier these Coverage Evaluation Surveys were conducted through UNICEF. The Coverage Evaluation Surveys undertaken by the Institute for Research in Medical Statistics (IRMS), New Delhi, (one of the permanent Institutes under the Indian Council of Medical Research) covered 90 districts in the country. The districts covered from different States were broadly in proportion to their population. Further, while selecting the districts in each major State, due representation was given to major geographical regions. Based on data collected in the study, the authors have interpreted the results of ante-natal care of pregnant women at the all India level.

The States of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, known as BIMARU States are lagging behind in performance level in comparison with the national average. These States account for about 45 per cent of the

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India's population and about 60 per cent of total births. About 43 per cent of population of these BIMARU States live below the poverty line as against about one-third for the country as a whole. Population growth in the BIMARU States continues to be high due to marriage at an early age, large size of population in the reproductive age group and high fertility rate. In view of this, it is important to study the utilization of ANC services by the pregnant women in these States. This paper presents the status of immunization of TT and ANC among pregnant women in BIMARU States.

METHODOLOGY

The study at the all India level covered 90 districts, of which 30 were from BIMARU States. The WHO cluster survey methodology has been followed in this survey. Thirty villages/wards were selected from each district using PPS systematic sampling. Further, with a random start, a sample of seven mothers of children up to one year of age was selected. The schedules used in the study are the same as used in WHO methodology with the addition of literacy of women. A village level schedule has also been used with details on distance from health facility, metaled road, etc. in addition to village size and composition. The results have been calculated for each State as well as combined for these four BIMARU States. The sampling design is self-weighting at the district level and hence simple proportions and averages based on the sample are unbiased estimates of corresponding population values. The aggregate estimates have been worked out by using appropriate weights based on estimated number of births at the State level. The results have also been obtained by background characteristics of sample households using post-stratified methodology. The responsibility of survey work was borne by the IRMS, New Delhi, with support from ICMR network of Human Reproduction Research Centres (HRRCs), ICMR Institutes and Medical College, Kota (Rajasthan). The survey work was done during June-October 1999.

FINDINGS AND DISCUSSION

The break- up of districts covered in BIMARU States are as under:

State	Number of Districts
Bihar	8
Madhya Pradesh	7
Rajasthan	5
Uttar Pradesh	10
Total	30

The study in these districts covered about 6,000 mothers. The characteristics of sample households have been presented in Table 1.

TABLE 1
CHARACTERISTICS OF PREGNANT WOMEN IN BIMARU STATES

Characteristics	Number	Percentage
Residence		
Urban	1817	29.6
Rural	4328	70.4
Religion		
Hindu	5366	87.4
Muslim	715	11.6
Sikh	37	0.6
Christian	13	0.2
Others	14	0.2
Caste		
ST	1473	23.9
SC	358	5.8
Others	4314	70.3
Education of Mothers (Women)		
Illiterate	3219	52.1
Primary	923	15.1
Middle	767	13.0
Hr. Sec	614	10.1
Graduate	602	9.7
Education of Fathers (Husband)		
Illiterate	1570	25.8
Primary	740	12.2
Middle	1072	17.6
Hr. Sec.	1406	22.8
Graduate	1332	21.6
Literacy of Parents (Couples)		
Both Illiterate	1392	22.6
Only Mother Literate	178	2.8
Only Father Literate	1826	29.7
Both Literate	2765	45.0

About 30 per cent of the women were from the urban and 70 per cent were from rural area. Among the women by religion, it was found that Hindu was 87.4 per cent, Muslim was 11.6 per cent and others were very few. The women belonging to ST, SC and others were 24, 6 and 70 per cent respectively. The illiterate women were about 52 per cent in BIMARU States as compared to

about 37 per cent at all India level. These characteristics are broadly in proportion to the respective population.

Ante-natal Care of Pregnant Women

The results for BIMARU States on ANC visits, immunisation of pregnant women for TT and receipt of (IFA) tablets vis-a-vis the national level are presented in Table 2.

TABLE 2
COMPARISON OF BIMARU STATES WITH THE ALL INDIA LEVEL
REGARDING ANC, IMMUNIZATION OF TT AND IFA (IN PERCENTAGE)

ANC	India	BIMARU	UP	MP	Rajasthan	Bihar
Antenatal Care						
Three or More ANC Visits	62.0	40.9	41.8	46.7	39.2	35.5
TETANUS TOXOID						
TT1	86.4	79.8	82.9	85.7	77.8	72.0
TT2/BOOSTER	77.9	67.9	74.8	77.5	69.3	49.8
NONE	13.6	20.2	17.1	14.3	22.2	28.0
IFA	72.5	60.9	62.9	73.8	54.2	51.1
Full ANC Package (3ANC, IFA, TT2/BOOSTER)	52.5	35.0	35.1	41.9	33.7	29.6

The proportion of mothers who had full package of ANC (those having 3 ANC visits, IFA and TT2/Booster) were 35 per cent for BIMARU States as against 52.5 per cent at the all India level. Within BIMARU States, these results varied from 30 per cent in Bihar to 42 per cent in MP. Minimum was in Rajasthan 33.7 per cent.

In regard to the pregnant women who were not receiving any TT immunization, it was 20 per cent in BIMARU States which is one and half times of the magnitude to that of the all India level. Further, within BIMARU States, mothers not receiving any TT immunization were as high as 28 per cent in Bihar and 14 per cent in MP.

As far as ante-natal care was concerned, (3 or > ANC visits), again it is clear from Table 2 that the coverage is poor in Bihar 35.5 per cent followed by Rajasthan 39.2 per cent while the national coverage was 62 per cent.

The coverage level by background characteristics in BIMARU States vis-à-vis India are presented in Tables 3 and 4 respectively.

TABLE 3
ANC SERVICES IN BIMARU STATES BY BACKGROUND CHARACTERISTICS
(IN PERCENTAGE)

Characteristics	3ANC VISIT	TT1	TT2/ BOOSTER	IFA
Residence				
Urban	55.7	88.1	80.7	69.3
Rural	34.7	76.3	62.6	57.4
Religion				
Hindu	40.6	79.8	68.3	61.4
Muslim	43.4	78.9	64.6	56.6
Sikh	45.9	86.5	75.7	83.3
Christian	39.3	97.9	88.0	77.8
Others	42.9	75.0	64.3	57.1
Caste				
SC	30.6	74.4	64.0	55.4
ST	24.3	64.5	49.4	44.7
Others	45.9	83.0	70.9	64.3
Literacy Of Mothers (Women)				
Illiterate	28.6	69.4	57.2	49.3
Primary	41.6	85.7	69.0	66.1
Middle	49.7	90.4	78.4	72.4
Hr. Sec.	60.7	94.1	83.9	74.9
Graduate	76.5	98.8	93.9	86.7
Literacy Of Fathers (Husbands)				
Illiterate	24.8	62.6	50.2	43.7
Primary	36.6	77.0	64.4	57.9
Middle	39.0	81.9	64.6	61.0
Hr. Sec.	40.9	85.9	73.0	65.5
Graduate	65.0	93.8	85.7	78.5
Literacy Of Parents (Couples)				
Both Illiterate	22.6	60.2	47.9	41.7
Only Mother Literate	41.8	82.0	68.0	59.7
Only Father Literate	33.2	76.5	64.4	55.3
Both Literate	55.8	92.1	80.5	74.9

As expected, the mothers availing of 3 ANC were mainly literate and mostly from urban areas (Table 3). The broad trends in the results of ANC services availed by the mothers in BIMARU States are similar to that of all India level. The proportion of illiterate mothers not availing of any ANC facility is much higher in BIMARU States as compared to all India level. Only 49 per cent of illiterate mothers had taken iron folic tablets while it was 87 per cent for graduate mothers in BIMARU States. IFA tablets were taken by 62 per cent of illiterates in

comparison to 82 per cent by graduate mothers at the national level. Though 53 per cent of scheduled tribes had received three ante-natal visits at the national level but it was only 24 per cent in BIMARU States. The study proves that education enhances the knowledge and utilization of ANC services by mothers.

TABLE 4
ANC SERVICES AT ALL INDIA LEVEL BY BACKGROUND
CHARACTERISTICS (IN PERCENTAGE)

Characteristics	3 ANC VISITS	TT1	TT2/ BOOSTER	IFA	3ANC,IFA,TT2 BOOSTER
Residence					
Urban	72.1	90.4	85.2	77.1	60.9
Rural	56.2	84.1	73.9	69.9	47.7
Religion					
Hindu	61.4	87.4	79.2	73.2	52.5
Muslim	60.1	87.6	75.4	74.8	52.4
Sikh	70.9	93.4	88.1	82.8	63.3
Christian	68.7	69.1	63.9	54.8	46.5
Others	67.7	73.6	67.3	68.8	57.6
Caste					
SC	56.1	85.8	78.1	72.0	48.7
ST	52.6	69.9	57.0	59.3	40.1
Others	65.5	89.3	81.5	74.9	55.9
Literacy Of Women					
Illiterate	43.7	76.9	66.6	61.6	37.1
Primary	61.7	88.7	76.7	76.6	53.3
Middle	70.2	90.9	84.1	79.0	59.5
Higher secondary	77.2	93.1	86.9	79.7	65.1
Graduate	84.4	96.4	92.6	81.5	70.7
Literacy Of Husband					
Illiterate	43.2	73.9	63.7	59.6	36.1
Primary	59.1	84.9	73.4	73.1	50.9
Middle	62.6	87.5	78.7	73.3	53.2
Higher secondary	66.5	90.3	83.0	76.5	56.4
Graduate	77.5	94.3	88.6	80.1	65.7
Literacy Of Couple					
Both Illiterate	39.1	70.7	60.3	56.8	32.7
Only Mother Literate	63.1	89.2	80.8	73.4	52.7
Only Husband Literate	47.7	82.3	72.2	65.8	41.1
Both Literate	73.4	92.2	84.9	79.5	62.3

Similarly, it was found that in every aspect of ANC services, BIMARU States remain far behind as compared to the country as a whole. While 30.6 per cent of scheduled caste mothers had received 3 ANC visits against 56.1 per cent at the national level. 59.3 per cent of scheduled tribe mothers had taken IFA tablets at the national level against 44.7 per cent in BIMARU States. Apart from SCs and STs, 81.5 per cent of other caste women had received booster immunization at the national level as compared to 70.9 per cent in BIMARU

States. Both at the national level and even in BIMARU States, it is found that education effects to a great extent on the attitude of both spouses for receiving ANC services. Interestingly, 96.4 per cent of mothers who received TT1 immunization were found to be graduates at the national level against 98.8 per cent in BIMARU States which was higher by 2.4 per cent than the national level. While 50.2 per cent of mothers who received booster immunization, had illiterate husbands against 85.7 per cent with graduate husbands in BIMARU States. Only 32.7 per cent of mothers had received full ANC services where both the spouses were illiterates vis-à-vis 62.3 per cent with both the husbands and wives had graduate level of education at the national level (Tables 3 and 4).

Delivery Management

The details of the delivery management at all India level and BIMARU States are presented in Table 5.

About 51.7 per cent of deliveries are being managed at home at all India level whereas this proportion was about 70 per cent in BIMARU states. Among the BIMARU states, it varied from 61 per cent in Rajasthan to 75 per cent in Bihar. The deliveries conducted in hospital were 34.1 per cent at all India level while it was only 7.1 per cent at health centre level. Uttar Pradesh had lesser hospital deliveries as compared to other BIMARU States. Also, it can be seen from Table 5 that delivery conducted in health centre was better in Rajasthan, 7.1 per cent, similar to that of all India level, as compared to other BIMARU States.

TABLE 5
DELIVERY MANAGEMENT (IN PERCENTAGE)

States	Place of Delivery			
	Home	Hospital	Health Centre	Others
All India	51.7	34.1	7.1	7.1
BIMARU	69.9	19.3	3.8	7.0
Bihar	75.1	16.1	1.8	7.0
Madhya Pradesh	67.5	25.8	3.9	2.8
Rajasthan	60.9	28.9	7.1	3.1
Uttar Pradesh	72.2	12.1	3.6	12.1

Reasons for Non-Immunisation

The reasons given for non-immunization of TT and ANC are presented in Table 6. The findings reveal that lack of information was observed to be the main reason for non-immunisation of Tetanus Toxoid and ANC in all the States. Obstacles have also been reported as reasons for non-immunization of TT and ANC in all the four States. The reason observed for non-utilization of immunization was similar in BIMARU States as well as in India, as a whole.

TABLE: 6
REASONS FOR NON IMMUNISATION OF TT AND ANC
(IN PERCENTAGE)

State	Reasons	TT	ANC/IFA
Rajasthan	Lack of Information	58.1	50.3
	Lack of Motivation	9.4	12.3
	Obstacle	32.5	37.4
Uttar Pradesh	Lack of Information	62.9	59.5
	Lack of Motivation	14.5	17.5
	Obstacle	22.6	23.0
Madhya Pradesh	Lack of Information	55.7	47.8
	Lack of Motivation	14.8	15.6
	Obstacle	29.5	36.6
Bihar	Lack of Information	76.2	83.9
	Lack of Motivation	5.2	10.2
	Obstacle	18.6	5.9
BIMARU States	Lack of Information	65.3	60.9
	Lack of Motivation	10.3	13.9
	Obstacle	24.4	25.2
All India	Lack of Information	58.5	41.2
	Lack of Motivation	21.5	41.2
	Obstacle	20.0	17.6

CONCLUSION

About 35 per cent of mothers received full package of ANC in BIMARU States as compared to 53 per cent at all India level. The proportion of pregnant women not receiving any TT immunization was 20 per cent in BIMARU States as compared to only 14 per cent at all India level. Among the BIMARU States, in Bihar, the highest proportion (28%) of the mothers had not received any TT immunization. A significant proportion (70%) of deliveries in BIMARU States is being managed at home only. Institutional deliveries were just half in the BIMARU States as compared to all India level.

Thus, these States need special attention as far as ante-natal services are concerned. People in these States are to be made literate and motivated to avail of full packages of ANC Services.

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PREVALENCE OF LOWER RTI AMONG MARRIED FEMALES IN THE REPRODUCTIVE AGE GROUP (15-45)

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ABSTRACT

The study reveals that out of 200 females, 81 of them suffered from reproductive tract infections (RTI) of which, a maximum number of 52 had bacterial infections. A prevalence of bacterial vaginitis 26 per cent, candidal vaginitis 6 per cent, trichomonal vaginitis 4.5 per cent, and mixed vaginitis 4 per cent was observed. It was also observed that the prevalence of RTI among females of Hindus and Muslims was almost similar. The highest number of RTI cases was found in the age group of 21-30 years. In the present study, the highest prevalence (54.5%) was found among the IUD users. Almost 60 per cent of cases of RTI were asymptomatic. When the treatment seeking behaviour of the females was concerned, it was found that 65 of them had not taken any treatment.

Key-words: Vaginitis, Asymptomatic, Wet mount,

Reproductive tract infection (RTI) is a global health problem among women, especially in South East Asian Region (SEAR) countries. Studies have found the prevalence of RTI in India, Bangladesh, Egypt, and Kenya in the range of 52-90 per cent. More than a million women and infants die of the complications of RTI every year.¹ RTI has become a silent epidemic that devastates women's life.^{1,2} A number of community-based and facility-based studies and review of scientific literature have found that some of the RTIs are sexually transmitted. The annual incidence of STIs in India is estimated at 5 per cent. This indicates that approximately 40 million new infections occur every year.³ Prevalence rates of bacterial vaginitis 13 to 46 per cent, trichomonal 3 to 14 per cent and candidal infection 6 to 9 per cent have been established in different studies^{4,5}. The present study was carried out to find out the prevalence of RTI and its relation with factors like religion, use of IUDs and other contraceptives, age, literacy and treatment seeking behaviour of women.

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MATERIALS AND METHOD

The study was carried out in one randomly selected municipal ward number 17 of Udaipur city of Rajasthan. 200 married women in the reproductive age group of 15-45 years were the sample respondents. Size of the sample was calculated by using a prevalence rate of 70 per cent from a previous study conducted in rural Karnataka for gynaecological morbidity¹¹.

$$N = Z^2 PQ / L^2$$

$$Z=2, P=70, Q=30 \text{ and } L=10\%$$

$$N=171.4$$

In all, 200 females were interviewed. Every 5th house was randomly included in the study through a pre-tested interview schedule followed by a detailed physical examination including per speculum examination and bimannual examination.

Laboratory Investigations^{6,7}

Vaginal pH Test: Vaginal pH was determined by dipping a pH paper into the discharge, present on the vaginal speculum after removing from the vagina to differentiate the different types of infections. pH of more than 4.5 was used as a diagnosis for bacterial vaginitis and pH more than 5.5 for trichomonas.

Amine Test: It was done by adding a drop of 10 per cent KOH on vaginal discharge taken on a clean microscopic slide, intense fishy odour indicated the bacterial vaginitis.

Wet Mount: Drop of vaginal fluid mixed with one drop of normal saline covered with coverslip was observed under light microscope for trichomonas and clue-cells.

Grams Staining: This was used for the test of gram negative cocco-bacilli (clue-cells) suggestive of bacterial vaginitis and presence of gram positive yeast bodies suggesting candidiasis.

DISCUSSION

Out of the 200 females examined, a total number of RTI positive was 81 (40.50%). Out of the 81 positive RTI cases, it was found that 52 were infected with bacterial vaginitis, 12 with candidiasis, 9 with trichomoniasis and 8 with mixed vaginitis (Table 1).

TABLE 1
DISTRIBUTION ACCORDING TO THE TYPE OF RTI

Type of RTI	No. of females	Prevalence (%)
Bacterial Vaginitis	52(64.1%)	26.0
Candidiasis	12(14.8%)	06.0
Trichomoniasis	09(11.1%)	04.5
Mixed Vaginitis	08(10.0%)	04.0
Total	81	40.5

Overall prevalence of RTI was significantly higher (50.6%) in Muslims in comparison to Hindus. This may be attributed to personal hygiene practices or some other practice related to myth or misconception that needs further investigation (Table 2).

TABLE 2
DISTRIBUTION OF CASES ACCORDING TO THE RELIGION

Religion	Female	Bacterial	Candidial	Trichomonal	Mixed	Total	Prevalence
Hindu	119	22	6	6	6	40	33.6%
Muslim	81	30	6	3	2	41	50.6%
Total	200	52	12	9	8	81	40.5%

$\chi^2 = 5.9$, $p < .02$, D.F. = 1

Out of the total sample population, most of the women (124) were either illiterates or just literates and not a single one was a graduate. RTI was highly prevalent among illiterates (62.5%). RTI prevalence rate was 48.3 per cent among just literates. Number of RTI cases decreased with an increase in educational status, showing a direct relationship in between the two. When illiterates and just literates (124) are compared with women having formal school education (76), a significant difference in RTI prevalence was observed (Table 3).

TABLE 3
DISTRIBUTION ACCORDING TO LITERACY STATUS

Literacy status	No. of females	No. of RTI cases	Prevalence (%)
Illiterate	64	40	62.5
Literate	60	29	48.3
Primary	38	7	18.4
Middle	22	3	13.6
Sec/High.Sec.	16	2	12.5
Graduate	0	0	0
Total	200	81	40.5

$\chi^2=18.8$, DF=1*, $p<<.001$ (*when illiterates and just literate are compared with others)

Several studies conducted in different parts of India have shown a prevalence of RTI in the reproductive age group ranging from 19-90 per cent^{4,5,8,9}. Maximum number of cases (62) of RTI was observed in the age group of 21-35 years showing a relation with period of high fertility. The fertility is also high which is higher in this age group. Similar findings were also observed in other studies in the age group of 21-30 years⁹ (Table 4).

TABLE 4
DISTRIBUTION ACCORDING TO AGE

Age in years	Females (N=200)	RTI cases (N=81)	Prevalence
16-20	18	7	38.8
21-25	28	15	53.57
26-30	59	30	50.84
31-35	42	17	40.4
36-40	33	06	18.18
41-45	20	06	30.00

The number of females (30) whose partners using condoms showed a low prevalence (16.6%) of RTI. While the prevalence of RTI was also low (30%) in non-users, in others it was just higher than 50 per cent. In IUD users, it was the highest (54.5%) which shows the administration of IUD did not follow proper aseptic techniques. Another study has shown a high prevalence (40%) of RTI in IUD users⁹. But in this study, the females using oral pill also showed a high

prevalence rate contrary to the statement that prevalence of RTI is lower among oral pill users by different authors. This was because most of the cases were of candidiasis in oral contraceptive users (40%) (Table 5).

TABLE 5
DISTRIBUTION ACCORDING TO CONTRACEPTIVES USED

Contraceptives	Females(N=200)	RTI cases(N=81)	Prevalence
IUD	55	30	54.5
Oral Pills	20	10	50.0
Condoms	30	05	16.6
Sterilisation	35	18	51.4
Non-users	60	18	30.0

About 60 per cent of cases were not having any clinical symptoms. Maximum number of cases (40) was of bacterial vaginitis which is often asymptomatic. The commonest symptom of bacterial vaginitis is excessive vaginal discharge which is generally ignored for a long time until any other significant symptom appears. The research shows that 75 per cent of the trichomonal cases were symptomatic because vulval pruritus is the main complaint in trichomoniasis, which is very irritating and requires immediate medical attention. A study conducted in 1990 reported that the symptoms of trichomonal infection vary from time to time and 1/3 of asymptomatic cases become symptomatic within 6 months¹¹. The most common complaint associated with trichomoniasis is vulvo-vaginal irritation (Table 6).

TABLE 6
DISTRIBUTION ACCORDING TO PRESENCE AND ABSENCE OF SYMPTOMS

Type of RTI	Symptomatic*	Asymptomatic*	Total cases*
Bacterial	11 (23.07%)	40(76.92%)	52(64.10%)
Candidiasis	07(58.33%)	05(41.16%)	12(14.80%)
Trichomonal	07(75.00%)	05(22.22%)	12(11.10%)
Mixed	07(70.00%)	01(12.50%)	08(10.00%)
Total	33(40.74%)	48(59.25%)	81(100.00)

* N = 81

It was found that 65 (80.25%) females had not taken any treatment. This could be because of so many reasons. Firstly, perhaps the symptoms were not so alarming (because the incidence of bacterial vaginitis was higher). Secondly, the females were too shy to reveal their problems and were ignorant of the consequences of RTI (Table 7).

TABLE 7
TREATMENT SEEKING BEHAVIOUR

Treatment	Females	Percentage
Taken	16	19.75
Not taken	65	80.25
Total	81	100

CONCLUSION

The present study reveals high prevalence of RTI (40.5%) among married females in the reproductive age group and shows a higher prevalence rate among Muslims. The most prevalent form of RTI was bacterial vaginitis with a share of 26 per cent. While the highest number of women affected by RTI were illiterates (62.5%). With an increase in education, the prevalence rate has come down to 22 per cent in case of middle educated women, 16 per cent in the case of secondary and higher secondary educated and zero in the case of graduate mothers. High prevalence of bacterial vaginitis, being asymptomatic, was also responsible for non-treatment seeking behaviour among the married women.

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HOSPITAL SANITATION AND HOUSEKEEPING -A REVIEW WITH SPECIAL REFERENCE TO CLEANING PRODUCTS IN INDIA

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ABSTRACT

The threat of nosocomial infection (Hospital borne infection) has brought third generation antibiotics into the market and prescribed intensively by the medical personnel. This has led to increasing cost of treatment. However, good cleaning practices and environmental sanitation procedures viz. disinfection, sterilization and stringent aseptic traditions can lead a long way towards reducing hospital infection and decreasing the cost of care in hospitals.

Various types of housekeeping products available for hospital and other health care agencies in India are reviewed in this article. Also various cleaning products, their use, advantages and disadvantages with each type and how to choose the right kind of disinfectant for hospitals are discussed. It also reviews the different kinds of housekeeping equipment which are used in hospitals, their use, advantages and disadvantages.

Kew-words: Disinfection, Detergent, Cleaning Products

Concern about the hazard of infection caused by environmental microorganisms (microbes) arises because of our close interaction with the environment and its high content of microorganisms, including important human pathogens². Wherever there is moisture and organic material, proliferation of microbes occurs in large numbers¹³. Even on dry, infertile surfaces, microbes survive in various relatively inactive states^{2,13}. Unfortunately, though it is easy to establish the presence of microorganisms in the environment, it is difficult to assess their role in causing human disease. One of the broad surveys of the hospital air by Greene and colleagues found a mean organism count of 350 to 700 organisms/m³^{1,14}. Another study by Ayliff et al has shown that the levels of

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bacterial contamination on floors are usually restored to its original level within 2 hours of cleaning, irrespective of the fact whether disinfectant is used or not¹. This ubiquitous threat of hospital infection (nosocomial infection) has stimulated the environmental cleanliness (housekeeping), disinfection and sterilization processes, and stringent aseptic traditions in operating room, including meticulous aseptic surgical technique.^{2,14}

The primary objectives of hospital cleanliness are two folds:

- * To disinfect so that the threat of nosocomial infection is reduced.
- * To create a clean and safe, attractive environment for patient, staff and visitors.

There are many different approaches to cleaning a patient room. The best way to arrive at a system that works for an organisation is to approach the question as logically as possible from the two aspects being considered: Effectiveness and Efficiency.

For maintaining a good housekeeping practice at least three things are essential:

- (i) Standardized Housekeeping Products
- (ii) Equipment
- (iii) Technique of cleaning and disinfecting.

The various housekeeping products and equipment, their advantages and disadvantages; and to choose the right kind of product for the hospital are discussed in this article.

Housekeeping Products

Cleaning: It means removal of all visible debris.¹⁴ Choosing cleaning products and equipment with an eye of cost, performance and convenience is a tedious task. However, it is necessary to do this task so as to achieve our objectives. Therefore, knowledge of the housekeeping products is necessary. There are two types of housekeeping products namely; disinfectants and detergent.

DISINFECTANT

A disinfectant is a substance that kills microorganisms on inanimate objects.⁶ Effectiveness of Disinfectants depends on four factors.^{2,14}

Temperature of water: Most effective when the environmental temperature rises. The same can be achieved by mixing it in hot water.

Strength of solution: The stronger the solution, the effectiveness of a disinfectant increases in a shorter period.

Duration of exposure: The longer a disinfectant remains on the surface the more effective it will be.

Cleanliness of surface: The most important thing to remember is that the disinfectant works the best on clean surface.

Although there are wide range of chemical disinfectants in use for hospital purposes for handwashing, part-preparation, etc. this article restricts to four main types of disinfectant used for housekeeping purposes^{3,4,14}.

- (i) Iodophors
- (ii) Phenolics^{3,4}
- (iii) Chlorine releasing agents^{3,4}
- (iii) Quats

In addition to these, there are other types of disinfecting agents viz. alcohols, halogens, peroxides, chlorhexidine (HIBITANT), Chloroxylenols (Dettol) etc. but they are not usually considered for general use in environmental services/housekeeping^{1,14,13}.

(i) Iodophors

They have iodine bases. They are best germ killers with a low pH. However, they are poor detergents as they act in low pH and stains the surface and they are very costly, so hardly used for disinfecting entire hospital. They are only used as antiseptics for skin.

(ii) Phenolics

They are disinfectants with carbolic acid base. They have better cleaning properties than iodophors. They are derived from distillation of coal tar. Chlorinated fraction and petroleum residues are also added. They are Black/White fluids and clear soluble fluids (CSP). They are irritant and corrosive to skin and mucosa and produce odour. The Black fluids (e.g. Jeyes fluids) are soluble in soap and are toxic and irritant to skin. White fluids are emulsified suspension and precipitate on surface and makes subsequent cleaning difficult. They have been replaced by CSP in hospital because of the above disadvantages.

TABLE 1
PHENOLIC DISINFECTANTS FOR ENVIRONMENTAL USE

Disinfectant	Type	Routine use Dilution %	Strong Concentration %	Remarks
Stericol	CSPD	1.0	2	Non Staining, Active against P.aeruginosa & Tubercular Bacilli, Cheap, stable & not readily inactivated by organic matters
Hycolin	CSP	1.0	2	
Clearsol	CSPD	0.625	1	
Izal	W	1.0	2	Emulsified suspension precipitates on floor.

CSP: Clear soluble phenol; D: contains added detergent; W: White fluid

(iii) Chlorine Releasing Agents

They are cheap and effective disinfectants, at low concentration and act by release of available chlorine. They are rapidly effective against viruses, fungi, bacteria and spores. However, since the solution is unstable so has to be prepared daily. It is readily inactivated by organic matters (e.g. pus, dirt, blood, etc.) and damages plastics, rubber, some metals and fabrics. They are not compatible with some detergents and acidic fluids including urine and liberate free chlorine which is harmful in a confined space. It is best for water treatment, toilets, basin, and swampy floors in powder form.

IV Quats

They are Quarternary Ammonium Compounds (QACs) e.g. ROCCAL, Zephiran, Marinol, Cetrimide. They are non irritating to skin, non toxic and bacteriostatic in nature¹. It is almost no odourless, rather it is a deodorant. They work best with pH 9-10 and thus effective disinfectant in combination with detergents. Ideal for use in food preparation areas. Active ingredients in an Quat Compound includes Alkyl Diethyl Benzyl Ammonium Chloride. Effective against Mycobacterium Tuberculosis^{14,15}.

TABLE 2
CHLORINE RELEASING AGENTS USED IN HOSPITALS

Preparation of Chlorine	Uses	Available %	Chlorine
Strong Alkaline hypochlorite solution • Chloros • Domestos • Sterite	Compatible with detergent Disinfects clean surface	10%	1,00,000 PPM
Hypochlorite or Hypobromite power • Septonite • Diversol BX • Vim & Ajax	Cleaning baths and bottles, sinks Non abrasive	0.5-1.0%	--
Non-abrasive Hypochlorite powder • Titan	For disinfecting baths & sinks	0.5-1.0%	--
Sodium Dichloroisocyanurate (NaDCC) Tablets • Sanichlor • Haztab • Multichlor • Presept	Convenient dispensing Easy & stable storage Unstable in solution state. Applied directly to spillage of blood from HBV & HIV patients ^{3,4} .	1%	10000 PPM

OTHER DISINFECTING AGENTS

Alcohols

Ethyl alcohol 70 percent and Isopropyl Alcohol 60-70 per cent are effective and rapidly acting disinfectants with antiseptic properties. The additional advantage with alcohol is that they evaporate leaving the surface dry. However, they have poor penetrative powers and should be used only on clean

surfaces. They are active against Mycobacterium but not against spores and non-enveloped viruses e.g. poliovirus (which tends to be resistant particularly to isopropanol)^{14,15}.

Alcohol impregnated wipes, may be used for rapid disinfection of smooth clear surfaces, e.g. trolley tops, thermometer, probes, steel tables tops, etc.

Hydrogen Peroxides

Hydrogen peroxide 3 per cent or 6 per cent (Virkon) is increasingly assuming a vital role in disinfecting equipment and environmental surfaces in UK because of its virucidal nature and reduced corrosiveness.

Choosing the Right Disinfectant for a Hospital

A well-chosen disinfectant should have the following properties¹⁶.

- Perform effectively in hard water
- Be compatible with detergent/soap.
- Remain unaffected by the material in bucket.
- Should be compatible with mop, scrubbing brushes and floor.
- Should not be readily inactivated.
- One should prefer bactericidal rather than bacteriostatic disinfectant.

The disinfecting properties of a disinfectant can be tested by RODAC Plate test after cleaning the floor or surface. A RODAC plate (Replicate Organism Detection and Counting) is a petridish containing a nutrient agar gel. The gel extends just beyond the edge of the dish so that the dish may be turned upside down and placed on surface to be tested e.g. a wall, floor, counter top, shower floor, overbed table, etc.² The dish is covered and stored for 24 hours at 37⁰ C and examined for bacterial growth. RODAC test is only for flat surfaces.

The Swab Method Test is ideal for testing irregular and curved surfaces. Swab is taken and transferred to a buffer solution and then plated to a growth medium to see the bacterial growth. Other tests available mostly in UK are SYKES test¹² (Kelsey and Maurer, 1974) and Standardized Suspension Test (Council of Europe 1987)^{5,11,15}.

DETERGENT

Detergents are surface-active chemical preparation; capable of emulsifying dirt.¹⁰ Soaps, alkalis and synthetic agents are detergents. They primarily contain sulfated fatty alcohol and are equally effective in both soft and hard water^{10,17}.

How Does a Detergent Act?

1. When soap is dissolved in water it emulsifies the droplets of grease into tiny particles which no longer repel the water but form a suspension with it and get washed out.
2. Soaps decrease the surface tension of water and penetrate more easily on the floor and remove the dirt.
3. Soap solution has a colloidal action i.e. it gathers tiny, soft jelly like clots which have a curious power to draw into themselves the particles of dirt while scrubbing.
4. Synthetic detergents have no oil base, so don't curd atop the wash water and hence float off the residual oil even in hard water.
5. Alkalis like trisodium phosphate are scouring powders which are popular usually in large scale cleaning. Only stone and plastic surfaces withstand repeated use of alkalis, rest requires solutions of low alkalinity.

Constitution of Soaps as Detergents

Soap consists of fats, builders, rosins, abrasives, fillers, germicides, scents and water¹⁷.

Fats in Soap are of Two Types

- Animal fat – e.g. fish, whale, seal, sheep or cattle.
- Vegetable oils – e.g. coconut, corn, cottonseed, olive, palm, peanut, sesame, sunflower, usually vegetable oil in the form of coconut oil is used for floor cleaning.

Builders Enable the Soap to Remove Soil

- Rosin is the residue remaining after the distillation of spirits of turpentine from the crude oleo-resin of certain species of pine. Rosin makes bar effective in cold water also.
- Abrasives, such as volcanic ash, sand, talc and borax are added to soap to increase its mechanical action. Needed to remove heavy oil and grease.
- Fillers are talc, starch or clay, with little value as cleaners.
- Scents are used in toilet soap and not used in hospitals.

INTERPRETING A PRODUCT LABEL

A plethora of potentially intimidating material is included on the label of any bottle of disinfectant or detergent. None of it is particularly relevant unless it can be interpreted^{10,14,15}.

The labels must contain:

- The name of the manufacturer
- Weight or measures in the container
- List of active and inert ingredients
- List of warnings and first aid instructions
- Measure to be taken if the product is swallowed or spilled on skin/clothing
- Registration No. with the Environmental protection Agency (EPA)
- Direction for use:
 - * Dilution ratio
 - * How to apply
 - * Whether rinsing is necessary or not
 - * How long to be left on surface
 - * Where not to use

OTHER CLEANING PRODUCTS

Bowl Cleaners

The original purpose of toilet bowl cleaner was removal of mineral deposits and stains on the inside of toilet bowl. To facilitate this, 10 per cent of hydrochloric acid or phosphoric acid is used, which is less toxic and corrosive than concentrated Nitric Acid. This is usually useful where water is hard.

Abrasive Cleaners

They are available in two types scouring powders and liquid detergents. Scouring powders contain a silica sand base with bleaching agent. The disadvantage with this is that along with the stains it removes the protective coating of the sink. It is used on swampy floors.

The newer liquid abrasives are better because they can be rinsed easily and faster than the powders.

Glass Cleaners

Two varieties are available-Alcohol based and Ammonia based. Alcohol based is preferred because it can be safely used on plexiglass and plastics and does not damage the surface.

Degreasers

Contains Butyl Cellosive or water based Sodium Metasilicate. These can be used without gloves and are beneficial for spot cleaning of grease.

Stainless Steel Cleaner

Stainless steel in lifts, refrigerators and coolers can be cleaned off and on. They do not need daily cleaning and are expensive.

Malodors

Perfumes are used as room fresheners. However, apart from food and tobacco smells, any other odour is because of unclean patient room or bathroom. Therefore, a proper cleaning of these areas is required.

Carpet Care Products

Most commonly used carpet care products are shampoos for use with rotary pads and extraction methods, defoamers, prepotters, solvent type stain removers, soilretardants, antistate and amosol type gum removers.

Floor Care Products

This includes strippers, floor finishes, sealers (optional) and spray buff products (optional)⁸.

Strippers: These are almost all ammonia-base products. A stripper's function is to remove finish from a hard-surface floor. Strong ammoniated strippers are not recommended for terrazzo.

Floor finishes: These are sophisticated chemical products. They have replaced wax almost entirely. Today's floor finishes are most often synthetic metal cross-link formulations that are harder and more durable than wax; the majority are water-base products. Their purpose is to protect the floor surface from the abrasive effects of foot and equipment traffic, spills, and stains. Finish also creates a surface that is easier to maintain than a bare floor and it provides an improved appearance.

Sealers: These are used to seal the floor, if the floor surface is old and/or very porous. Most sealers have a solvent base and as such have a fairly strong odour.

EQUIPMENT

The variety of equipment which might be required to purchase during the course of a normal budget year ranges from the mundane and inexpensive to the complex and costly item. Things like buckets, wringers, mop handles and carts fit into the first category, whereas products like floor machines, autoscrubbers and extractors fall into the latter. No matter what kind of equipment we are purchasing, more than one choice is always available, and it pays well to investigate the options before actually purchasing something^{13,14}.

The standard material for these carts used to be steel, but today stainless steel and polystyrene carts are also available. Carts can be purchased with or without shelves, doors, trash receptacles, or with or without shelves for mop buckets. A cart with a lockable door is a sound choice for paediatrics, while a cart used in surgery does not need a shelf for a mop bucket. The point is that, while purchasing carts, you should keep the specific needs of your institution in mind.

Vacuum Cleaners

These are either for wet pickup or dry pickup. A good vacuum cleaner is essential for a good carpet care programme, just as a wet-vac is indispensable for managing large volumes of water. A good heavy-duty, large vacuum is particularly useful for corridors, large meeting rooms, etc. Vacuums often incorporate mechanical action (beater brush) to loosen soil and lift and separate fibers with the vacuum action. Any vacuum used in a health care facility should be equipped with disposable bags.

Things to consider in choosing a wet vacuum are: motor size and type, tank capacity, style, material used in construction of the tank, shape of tank and filtering system. Many wet vacuums can be adapted for use as dry vacs by adding a filter/bag apparatus.

Floor Machines

There are two models available: Electric and Non-electric models. They are machines with regular speed, variable speeds, high speeds and even ultrahigh speeds. The standard floor machine operates at 175 revolutions per minute (rpm) and can be used to strip, spray buff and clean carpet. High-speed machines run anywhere from 300 to 700 rpms and ultrahigh speeds go as high as 1200 rpms. These higher-speed machines may or may not be recommended for stripping and are almost always not to be used for carpet care.

Consider the following things while comparing manufacturers: the ease of operation, safety features, horsepower, motor placement and height, construction material, availability of spare parts and the diameter of the brush or pad holder.

Floor machines are available in sizes from 12 inches to 23 inches. Obviously, an operator can cover more ground with a 20-inch machine than with a 15-inch, but a large machine may not be practical in a crowded patient room or a small office. Many of the high and ultrahigh speeds are only available in the 20-inch diameter which simplifies the size decision.

Extractors and Auto scrubbers are similar to floor care machines: The earlier is for use on carpet, the latter for hard flooring. In both, cleaning solution is poured from one tank and is vacuumed into another, taking the soil along with the solution.

The extractor uses pressure to inject cleaning solution into the carpet, and it then immediately retrieves it. It is possible to increase the mechanical action by adding a power head attachment to the extractor unit.

The Auto Scrubber also puts cleaning solution down; then it uses mechanical action, by means of brushes or pads, to clean the floor before retrieving the solution.

Brush size is a consideration in choosing an auto scrubber, while the amount of pressure used to inject solution is a big factor while selecting an extractor.

CONCLUSION

In health care facilities sound justification is frequently required before approval is granted for capital equipment purchases and product requests. Sometimes those request are denied even when the justification is impeccable because the dollars are not available. It is, therefore, imperative to spend wisely, whenever the opportunity to purchase equipment arises. Investigate all the options available to secure the best price for the most useful piece of equipment and the best housekeeping products which meet the needs of your organisation.

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