Antibiotics, the pill, and pregnancy

Maria Mastrantonio, Honeyia Minhas, Alison Gammon

Abstract

Objectives—To establish if advice concerning risks of pregnancy when taking oral contraceptive pill and antibiotics is being offered.

Method—A retrospective audit of notes of 100 female patients aged 15–39 who were prescribed antibiotics.

Results—Documentation of use of contraception was noted in 3% of patients. Advice concerning risks and further precautions was noted in this 3% but not in any other records.

Conclusion—The audit identified a gap in documentation and/or clinical practice in advising women of childbearing age of the risk of conceiving when using oral contraceptive pill and antibiotics. Recommendations are given as to how this may be addressed.

(J Accid Emerg Med 1999;16:268–270)

Keywords: antibiotics; contraception; pregnancy

Since the introduction in 1960 of the oral contraceptive pill (OCP) its use increased steadily until the late 1970s and levelled off thereafter, possibly due to publication of reports detailing adverse effects. There are an estimated 60 million users of the “pill” world wide¹ and in Britain 39% of women aged 15–39 were found to be taking the OCP.²

The OCP prevents conception by exerting a negative feedback on secretion of follicle stimulating hormone and luteinising hormone. This prevents development of graafian follicles and subsequent ovulation. In addition, high concentrations of oestrogens and progestins produce alterations in the genital tract and endometrium that may contribute to the contraceptive effectiveness of these preparations.³

Although more than 85% of couples who are sexually active claim to be using some method of contraception, it is known that up to one third of pregnancies can be unplanned. The failure rate of the OCP is very small, between 0–1%⁴ and is often attributed to one of the following:

- Patient forgetting to take the OCP.
- Gastroenteritis impairing absorption.
- Drugs, for example phenytoin, increasing the metabolic activity of the liver and causing increased elimination of contraceptive steroids.
- Concomitant administration of antibiotics and the OCP.

It is this last point that we discuss and explore in this audit.

The first clinical report of interaction between the OCP and antibiotics appeared in 1971 when it was observed that there was an increased incidence of intermenstrual bleeding

in women who were reliably taking the OCP and rifampicin (for treatment of tuberculosis).⁵ In the absence of identifying a local cause responsible, intermenstrual bleeding is often regarded as a warning signal of loss of contraceptive efficacy if it has not occurred previously in the same woman on the same OCP.

Subsequent studies showed that pregnancy was the only major reported adverse incident related to the use of antibiotics and the OCP; the most commonly involved antibiotics being ampicillin, co-trimoxazole, and the tetracyclines.⁶ Back *et al* undertook a data analysis of the records of the Committee on Safety of Medicines in the UK between 1968 and 1984 and identified 63 pregnancies reported in women taking the OCP and antibiotics, with penicillin and tetracyclines being the most frequently cited.⁷ They observed that this was likely to be a small percentage of the true incidence due to under-reporting.

There are several theoretical mechanisms for the association of failed OCP and antibiotic treatment⁸:

- Rifampicin has been shown experimentally to increase the hepatic enzymes that accelerate the elimination of oestrogen and progestin compounds from plasma by forming inactive metabolites.
- Antibiotics that alter either the load or nature of bacterial flora in the gut may reduce absorption of the OCP.
- Although experimental data are scant and conflicting, there is a suggestion that an increase in gut motility could reduce the absorption time and may lead to increased excretion of, for example, erythromycin.
- There is evidence that women taking the lower dose OCP may be at particular risk of critical falls in circulating steroid concentrations.

The clinical significance of the association needs to be considered. The millions of women who take the OCP are well and do not consider themselves to be taking medication. Doctors do not always specifically ask if a woman is taking the OCP. One study demonstrated a 70% error rate in documentation of hospital records, with the most frequent problem being a failure to document all pre-admission medication taken by a patient.⁹

The exact number of women taking the OCP and antibiotics concurrently is not known, but assumed to be large. Between 1973 and 1984 there were over 300 million prescriptions written for antibiotics in England, but only a total of 63 reported cases of pregnancy between 1968 and 1984.⁷ From the available information it would appear that the reported risk of pregnancy is small, but inconsistencies in reporting may result in an under-appreciation of the true incidence. It was

Accident and
Emergency
Department, Stoke
Mandeville Hospital,
Mandeville Road,
Aylesbury, Bucks
HP21 8AL
M Mastrantonio
H Minhas
A Gammon

Correspondence to:
Dr Gammon, Consultant in
Accident and Emergency
Medicine.

Accepted 11 February 1999

Figure 1 Conditions needing antibiotics (ENT = ear, nose, and throat; UTI = urinary tract infection).

Figure 2 Antibiotics prescribed by the A&E department.

recognised that although this potential risk was known and reinforced in the general practice community, it was not an issue that had previously been highlighted in hospital practice. The aim of this audit was to look at current practice in the light of this information and make recommendations for changes in future practice if appropriate.

Method

This was a retrospective audit of patients who presented to the accident and emergency (A&E) department between January and May 1998. Inclusion criteria were that the patient was female, aged from 15–39, not pregnant, and was given a prescription for oral antibiotics. The first 100 cases were reviewed for documentation of: the method of contraception (if any) and advice regarding the need for additional contraceptive methods during treatment.

Results

The conditions for which women were treated (fig 1) shows the majority of consultations were for skin and ear, nose, and throat conditions. The most frequently prescribed antibiotic was co-amoxiclav (56.5%) with other penicillin preparations contributing a further 21.3% (fig 2).

Of the 100 records audited only three had documentation of contraceptive use (two OCP and one Depo-Provera). In cases of patients

known to be using the OCP it was recorded that advice regarding further precautions was given. In one it was recorded, "advice re: precautions given" and in the other "advised about extra methods, that is condoms". There were no other records noting that advice had been given.

Discussion

In 1993 it was shown that 39% of women aged 15–39 in England and Wales were on the OCP. If that figure was compared with that in this audit there is a potential for lack of appropriate advice being given to 37 patients. Although highly unlikely, this represents a potential of 37 cases of unwanted pregnancy and subsequent litigation.

It was noted that when women were identified as taking the OCP they were given advice and that this was documented. It was postulated that medical staff were not recording the receiving and giving of information, but it was acknowledged that from a medicolegal view point such an omission would be indefensible. In the event of a single pregnancy arising as a result of this failure of communication and/or documentation the potential cost to the trust is of the order of £100 000 (personal communication from Medical Defence Union to Dr Minhas, July 1998).

It would seem that erring on the side of caution is sensible and that women who are at potential risk should be advised accordingly. The current recommendations advise that a woman on the OCP should use additional contraceptive cover during short courses (two weeks or less) of antibiotics and for a further seven days after the last antibiotic tablet. If the seven days run beyond the end of a packet then a new packet should be started immediately and continued without a break. With the use of "everyday" preparations of the OCP the inactive pills should be missed out. The next pill free week would be taken at the end of this second packet as usual.

Recommendations

In order to heighten awareness of staff the following were proposed:

- Women should as a routine be asked if they are using the OCP, perhaps with use of a tick box on the A&E records.
- All staff should consider whether antibiotics are absolutely necessary given possible side effects.
- A reminder to all staff should be posted inside the "to take out" drugs cupboard so that those dispensing medications (whether this be doctors or nurses) can ensure that advice is given if appropriate.
- An information leaflet could be drawn up and given to all women known to be on the OCP and for whom antibiotics are prescribed. A sample leaflet is shown in fig 3 and is based on existing information leaflets given out in family planning clinics in Buckinghamshire.

Conclusion

Although there is a high potential for unwanted pregnancy in women taking oral antibiotics

Antibiotics and the "pill"

Your doctor has prescribed you antibiotics which are necessary to treat the infection. However the antibiotics can interfere with the pill and make it less effective. This means that you may not be protected from pregnancy if you have sex, even though you are taking the pill.

You are advised that you should take additional precautions, that is use a condom, during the time that you are taking the antibiotics, **and for 7 days after completing the course of antibiotics.**

If this runs into your pill free week you must start a new packet **IMMEDIATELY** and continue without a break until your new pill free week, after which you can continue to take the pill as normal.

If you are at all worried about this advice contact either your own general practitioner, the local family planning clinic, or the accident and emergency department. **Remember, it is important that you complete your course of antibiotics as prescribed.**

Figure 3 Sample information leaflet on antibiotics and the pill.

while on the OCP, official figures do not bear this out, perhaps due to under-reporting. While the exact figures are not known the medicolegal and human cost should not be underestimated.

Staff in the A&E department need to be aware of this association and be encouraged to

improve documentation and the giving of information in order to minimise the risk. This should be reinforced with written information to advise patients how to minimise the risk and prevent an unwanted pregnancy.

Conflict of interest: none.

Funding: none.

- 1 Elstein M. Present status of hormonal contraception. *Adv Contracept* 1996;12:155–66.
- 2 *Social trends*. London: HMSO, 1995;26:2.23
- 3 Zachariasen R. Loss of oral contraceptive efficacy by concurrent antibiotic administration. *Women Health* 1994; 22:17–26.
- 4 Govan ADT, Hart DM, Callander R. *Gynaecology illustrated*. 4th Ed. Edinburgh: Churchill Livingstone, 1993: 441.
- 5 Reimers D, Jezek A. Simultaneous use of rifampicin and other antituberculous agents with oral contraceptives. *Prax Pneumol* 1971;25:255–62.
- 6 Szoka PR, Edgren RA. Drug interactions with oral contraceptives: compilation and analysis of an adverse experience report database. *Fertil Steril* 1988;49:31S–8.
- 7 Back DJ, Grimmer SFM, Orme MLE, *et al*. Evaluation of Committee on Safety of Medicines yellow card reports on oral contraceptive-drug interactions with anticonvulsants and antibiotics. *Br J Clin Pharmacol* 1988;25:527–32.
- 8 DeSano EA Jr, Hurley SC. Possible interactions of antihistamines and antibiotics with oral contraceptive effectiveness. *Fertil Steril* 1982;37:853–4.
- 9 Rossi AC, Knapp DE, Anello C, *et al*. Discovery of adverse drug reactions—a comparison of selected phase IV studies with spontaneous reporting methods. *JAMA* 1983;249: 2226.

Regional educational grant

The British Association for Accident and Emergency Medicine has established a fund to support regional training meetings. This is not intended to replace current provision for SHO or specialist registrar training. Grants of up to £500 are available to each region (deanery) to support these meetings.

It is hoped that these grants can support a variety of meetings that are presently not supported by current funding within the NHS.

Applications will be considered for larger grants where regions put in a joint bid.

Applications should be made to the Chairman of the Academic Committee, BAEM, 35/43 Lincoln's Inn Fields, London WC2A 3PN. Full details of the regional grant programme are available on the BAEM web site.