

Management of women referred to early pregnancy assessment unit: care and cost effectiveness

M A Bigrigg, M D Read

Abstract

Objective—To assess the efficiency of an early pregnancy assessment unit in the care of women with bleeding or pain in early pregnancy.

Design—Analysis of women attending in the first year of the unit's operation and in the six months immediately before its introduction.

Setting—Early pregnancy assessment unit in a district general hospital serving a population of 310 000.

Patients—1141 women referred with bleeding or pain in early pregnancy.

Main outcome measures—Length of stay in hospital required for diagnosis and treatment.

Results—Before the unit was established the mean admission time was one and a half (range half to three) days for women who required no treatment and three (one and a half to five) days in women requiring evacuation of uterus. These times were reduced to two hours as an outpatient and one day respectively for most women after the unit was established. Between 318 and 505 women were estimated to have been saved from unnecessary admission, and 233 had their stay reduced; the associated saving was between £95 000 and £120 000 in one year.

Conclusions—The early pregnancy assessment unit improved the quality of care and also produced considerable savings in financial and staff resources.

Introduction

In the past decade much attention has been paid to the provision of maternity services, with numerous recommendations being made for improvements.^{1,2} These studies, however, have not considered the management of women with miscarriages, which occur in up to one in five confirmed pregnancies, or of the many women who have a threatened miscarriage.

The report of the standing medical advisory committee states that "medical audit can improve the appropriateness and adequacy of clinical care."³ Medical audit can also be used to ensure that scarce resources are used to greatest advantage. We reviewed the practice of routine admission of women with pain or bleeding in early pregnancy and assessed the effect of introducing an early pregnancy assessment unit on patient care and cost of treatment.

Methods

We studied all women admitted to our hospital with pain or bleeding in early pregnancy in the six months before the early assessment unit was set up (1 January to 30 June 1989) and all those referred to the unit in its first year (17 July 1989 to 16 July 1990). The hospital serves a population of 310 000. The number of women referred or admitted, the length of stay in hospital, and

the cost of treatment were compared for the two periods.

MANAGEMENT PROCEDURE BEFORE JULY 1989

Our hospital, in common with many district general hospitals, responded to calls from general practitioners about women with pain or bleeding in early pregnancy by admitting the women, usually straight away, causing great upheaval to them and their families. After admission most women who did not require emergency treatment had to wait, often for some time, until the appropriate investigations could be arranged to confirm the diagnosis. Most of these women had a viable pregnancy and were subsequently allowed home. Those who required either an evacuation of retained products of conception or laparoscopy often had to wait again until a space was found on the "urgency" operating list; in many cases space was found only late at night—an unsatisfactory arrangement for everyone concerned.⁴

MANAGEMENT PROCEDURE OF UNIT

When a woman requires referral for bleeding or pain in early pregnancy, or both, her general practitioner contacts the on duty senior house officer and makes her an appointment at 8.15 am on the next day, provided that the woman is not shocked or bleeding heavily, in which case she is admitted to hospital immediately. Patients who have had an ectopic pregnancy are also seen in the day assessment unit to confirm the presence of an intrauterine pregnancy.

The woman is asked to bring an early morning sample of urine when she attends the unit. The duty senior house officer takes a brief history including parity, gravidity, and length of amenorrhoea. Venepuncture is performed and a full blood count and blood group analysis is done. While waiting for the results the woman has ultrasonography.

The woman is then seen again by the senior house officer, who looks at the results and decides on the appropriate management (figure). Assessment of the woman is completed by 10.00 am. The duty registrar and consultants are available on site at this time if necessary. Women not requiring admission will have spent an average of less than two hours in the hospital. Standard letters for the general practitioner are available for women in each diagnostic category and contain gaps for the results of tests and ultrasonography.

Results

In the six months before the unit was established 370 women were admitted to the ward at the request of their general practitioner. In the first year of operation 771 women were referred to the unit (referrals varying from none to five a day); 175 were admitted directly to the hospital at their general practitioners' request for evacuation of retained products of conception; and

Gloucester Royal
Hospital, Gloucester
GL1 3NN

M A Bigrigg, MRCOG,
registrar in obstetrics and
gynaecology
M D Read, MRCOG,
consultant obstetrician and
gynaecologist

Correspondence to:
Mr Read.

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22 were admitted directly with ectopic pregnancies requiring immediate surgery. The table shows the results of the initial assessments.

Before the unit was established women found to have a viable pregnancy, or to have had a complete abortion, or not to be pregnant stayed in hospital for an average of one and a half (range half to three) days. The duration of stay for those women requiring an evacuation of the uterus was three (one and a half to five) days. Women often had to stay longer than necessary because ultrasonography was not available at weekends and public holidays and had to be fitted around booked appointments during weekdays. Since the unit was established most women have been treated as day cases and the maximum stay has been one and a half days. For women with a viable pregnancy or who were not pregnant the stay was reduced from one and a half days to two hours.

The proportion of women presenting to the early pregnancy assessment unit who needed repeat ultrasonography or were not pregnant was greater than the proportion presenting in the previous six months (11% *v* 8% for repeat ultrasonography and 16% *v* 5% not pregnant). The difference probably reflects a greater tendency to refer early since the unit was established; the figures include women who had complete abortions and who would previously have been treated at home.

The reduction in length of stay for evacuation of the uterus from three days to one day resulted in a saving of 466 bed days. In addition, 505 women were referred to the unit who, if they had been referred before the unit

Results of assessment in women admitted to hospital or referred to early assessment unit with pain or bleeding in early pregnancy

| | No (%) of women | |
|---|---------------------------------------|--|
| | Six months before unit opened (n=370) | First year of unit's operation (n=771) |
| Viable pregnancy | 118 (32) | 292 (38) |
| Possible viable pregnancy (repeat ultrasonography required) | 20 (5) | 88 (11) |
| Evacuation of uterus required | 196 (53) | 233 (30) |
| Not pregnant or complete abortion | 18 (5) | 125 (16) |
| Laparoscopy required | 18 (5) | 33 (4) |

Cost of management and savings produced by assessment unit

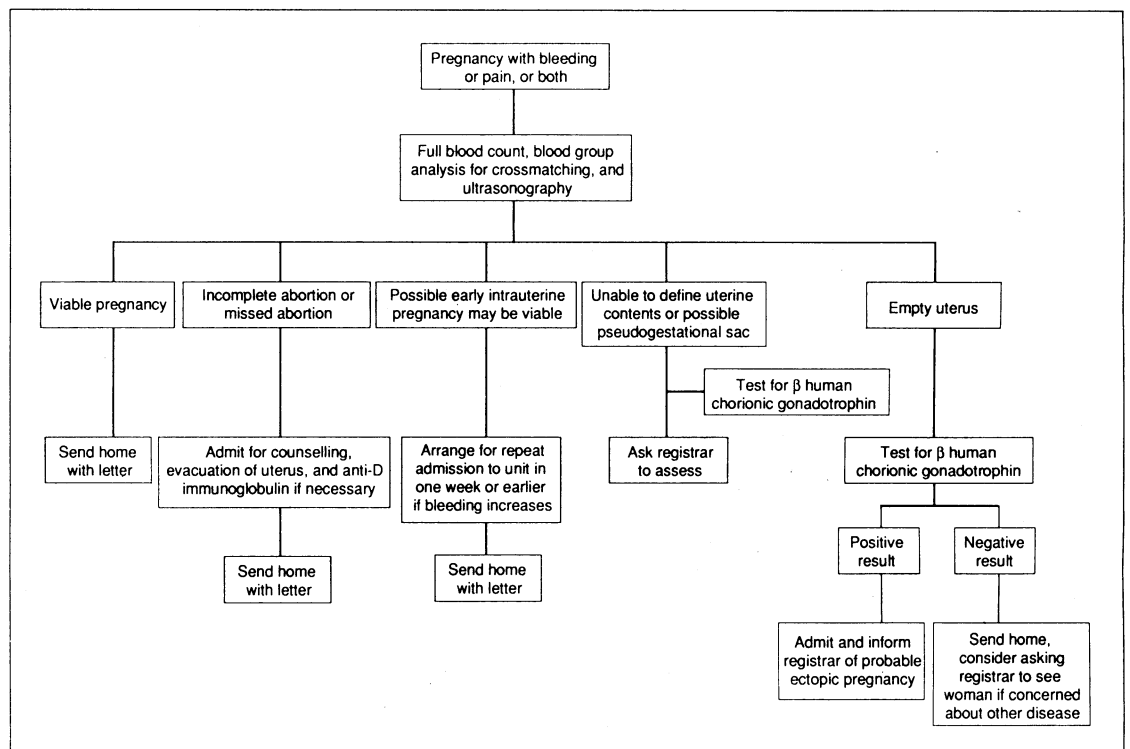
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| Women requiring admission: | |
| Cost of dilatation and curettage as day case | £80 |
| Cost of dilatation and curettage as overnight stay | £130 |
| Saving per case | £50 |
| Total saving=233×£50 | £11 650 |
| Women admitted unnecessarily: | |
| Cost of overnight stay without treatment | £90 |
| Total saving based on extrapolated data=934×£90 | £84 060 |
| Total saving based on first year's data=1216×£90 | £109 440 |

was set up, would have been admitted unnecessarily. The mean admission time for such women was one and a half days; referral to the unit therefore saved roughly 750 bed days, although previously some women may have been treated at home. Extrapolation from the data for six months before the unit opened suggests that 312 women were admitted unnecessarily in a year, and the unit would have saved 468 bed days. The box shows the financial savings of the savings in bed days based on figures provided by our finance department.

There were no identifiable savings for women admitted with a possible ectopic pregnancy, but the availability of the unit seems to allow earlier diagnosis, although the numbers are too small to allow meaningful statistical analysis. The overall savings were between £95 000 and £120 000. These are not true cash savings but represent a saving in resources that can be used elsewhere.

Discussion

The assessment unit is open seven days a week. Rearrangement of the appointment system and introduction of a limited on call system means that haematology and ultrasonography services are always available. The services have benefited from not having to fit emergency work into their routine schedules. The nursing staff now spend less time on administration,



trying to find results and arrange ultrasonography, and apologising to and caring for patients distressed by the delay in diagnosis and treatment. The out of hours work for junior staff has decreased. Assessment of these patients when the doctors have just come on duty seems to have increased their interest and has probably improved their management. In addition, when the results of all investigations become known a senior doctor is always available for consultation if necessary. All operative procedures are supervised by senior doctors and out of hours operating is avoided.

The response from general practitioners has been favourable. They receive immediate summaries of their patients' diagnoses and treatment and have expressed particular satisfaction with the ease of access to ultrasonography in cases of threatened miscarriage.

We also believe that the unit provides patients with an improved quality of service. Patients feel that their condition is a priority to the staff. Their condition is usually diagnosed in less than two hours and treatment completed in less than a day. Patients are also spared the anxiety of unnecessary admission to hospital, with

the associated domestic problems, especially if women have other children.

The principal disadvantages are that admission to hospital is delayed for a few hours, although immediate admission is possible when clinically necessary, and that a doctor and nurse must devote up to the first two hours of the working day to dealing with assessment of day cases. The workload associated with such assessment is variable.

We suggest that all acute gynaecological units should organise an early pregnancy day case assessment unit. We believe that this would improve the quality of service to the patients and rationalise the use of financial and staff resources.

- 1 Maternity Service's Advisory Committee. *Maternity care in action. Part 1—antenatal care.* London: HMSO, 1982.
- 2 Royal College of Obstetrics and Gynaecology working party on antenatal and intrapartum care. *Report.* London: RCOG, 1982.
- 3 Standing Medical Advisory Committee. *The quality of medical care.* London: HMSO, 1990.
- 4 Buck N, Devlin MB, Lunn JN. *The report of the confidential enquiry into perioperative deaths.* London: Nuffield Provincial Hospitals Trust, 1989.

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ANY QUESTIONS

Patients are usually advised to discontinue the oestrogen containing combined pill for at least four weeks before elective major surgery or surgery to the legs.¹ Should the same policy invariably be followed for women taking oestrogens for climacteric symptoms?²

Natural oestrogens affect haemostasis far less than the combined contraceptive pill, and a comprehensive review in 1982 stated: "At present it may be concluded that oestrogen replacement therapy, per se, does not place the healthy postmenopausal woman at greater risk of developing arterio-venous thrombosis."³ I do not know of any subsequent research reports to challenge this authoritative opinion. Moreover, if the oestrogen is given in a natural form and in a dose substantially equivalent to and replacing the function of functionless ovaries it may be argued that to insist on stopping such oestrogen would be like castrating women in the late reproductive years as a prerequisite for major surgery.

The other side of this argument, however, is that if a postmenopausal woman is in a naturally safer state than she might be, for example, with either ovarian or replacement oestrogen she might do better to continue so. The possibility cannot be excluded, however, that a woman with some known or unknown predisposition to venous thrombosis may not be made more likely to develop this because of the added natural oestrogen. Furthermore, the stakes are lower than for the combined pill if hormone replacement treatment is stopped for a few weeks: there is no fear of unwanted pregnancy with its inevitable physical and emotional risks.

The risk of thrombosis increases with age, and some doctors argue strongly that women over 45 should normally receive some form of prophylactic antithrombotic cover for major surgery. Given this, the hazards of continuing replacement with natural oestrogens would surely be negligible in healthy women free of all other risk factors. An exception is oestradiol implants: not only is there a regular surge in blood levels during the first month after insertion but routine reinsertion in some women precipitates an extraordinary and unpredictable rise. A blood concentration of 9600 pmol/l, for example, was recently reported by D McKay Hart (triennial meeting of the Joint Committee on Contraception, Royal College of Obstetricians and Gynaecologists, London, 14 September). Implant users should at least have their blood oestradiol measured before elective major surgery. With that exception, oestrogen replacement treatment should generally be viewed as a relative not an absolute contraindication to

major surgery. The usual synergism with other risk factors such as obesity would apply—that is, more than one relative contraindication equates to an absolute contraindication. Moreover, for all major surgery in this age group the doctor would need a reason not to give, for example, heparin, 5000 units every 12 hours.

—J GUILLEBAUD, *medical director, Margaret Pyke Centre*

- 1 Guillebaud J. Surgery and the pill. *BMJ* 1985;291:498-9.
- 2 Slater PA. Hormone replacement treatment. *BMJ* 1989;299:51.
- 3 Notelowitz M, Ware M. Coagulation risks with postmenopausal oestrogen therapy. In: Studd JWW, ed. *Progress in obstetrics and gynaecology.* Edinburgh: Churchill Livingstone, 1982: 228-40.

Is there any evidence that the consumption of tea without milk is carcinogenic?

Some tannins, such as those present in tea, have, under unrealistic conditions of exposure, been shown to be carcinogenic in animals.¹ Also, traces of carcinogens of the polycyclic aromatic hydrocarbon type—for example, benzo[a]pyrene—have been reported to be present in tea.² If humans were at risk from developing cancer from the presence of such chemicals in tea there would be no reason to expect it to disappear after milk was added. Furthermore, rats fed continuously on a diet containing excessive concentrations—for example, 20%—of lactose (the sugar present in milk) are prone to develop adrenal medullary and testicular tumours. If the results of such unrealistic experiments were relevant to man the addition of milk to tea might increase rather than reduce the risk of cancer. Drinking tea hotter because it has not been cooled down by the addition of cold milk might theoretically damage the lining of the oesophagus and stomach, and such damage might theoretically increase the risk of cancer. But there is no evidence that this is in fact so. Indeed, there is no convincing evidence that the drinking of tea, either with or without milk, constitutes a risk of cancer for man. —FRANCIS J C ROE, *consultant in toxicology, London*

- 1 International Agency for Research on Cancer. Tannic acid and tannins. *IARC monograph on the evaluation of carcinogenic risk of chemicals to man* 1976;10:253-62.
- 2 Gray JI, Morton ID. Some toxic compounds produced in food by cooking and processing. *Journal of Human Nutrition* 1981;35:5-23.
- 3 Abelson PH. Testing for carcinogens with rodents. *Science* 1990;249:1357.
- 4 Ames BN. Dietary carcinogens and anticarcinogens: oxygen radicals and degenerative diseases. *Science* 1983;221:1256-64.
- 5 Ames BN, Gold LS. Too many rodent carcinogens: mitogenesis increases mutagenesis. *Science* 1990;249:970-1.