

## Consultation patterns and provision of contraception in general practice before teenage pregnancy: case-control study

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### Abstract

**Objectives** To determine patterns of consultation in general practice and provision of contraception before teenage pregnancy.

**Design** Case-control study, with retrospective analysis of case notes.

**Setting** 14 general practices in Trent region.

**Subjects** 240 registered patients (cases) with a recorded conception before the age of 20. Three controls per case were matched by age and practice.

**Main outcome measures** Consultations in general practice and provision of contraception in the 12 months before conception and recorded provision of contraception at any time before conception.

**Results** Overall, 223 cases (93%) had consulted a health professional at least once in the year before conception, 171 (71%) had discussed contraception in this time, and 121 (50%) had been prescribed oral contraception. Cases were more likely to have consulted in the year before conception than controls (odds ratio 2.70, 95% confidence interval 1.56 to 4.66). Most of the difference was owing to consultation for contraception. Overall, 53 cases (22%) resulted in a termination of pregnancy. Cases whose pregnancy ended in a termination were more likely to have received emergency contraception than either their controls (3.21, 1.32 to 7.79) or cases resulting in other outcomes (3.01, 1.06 to 8.51).

**Conclusions** Most teenagers who became pregnant attended general practice in the year before pregnancy, and many had sought contraceptive advice. The reluctance of teenagers to attend general practice for contraception may be less than previously supposed. The association between provision of emergency contraception and pregnancy ending in termination emphasises the need for continuing follow up of teenagers consulting for this form of contraception.

### Introduction

The United Kingdom has the highest teenage pregnancy rate among 15-19 year olds in western Europe,<sup>1</sup> and associated problems have recently been highlighted.<sup>2</sup> Around 35% of teenage pregnancies

result in a termination, and continued pregnancy is associated with physical, psychosocial, and educational complications for both the mother and the child.<sup>2</sup> Teenage pregnancy has been identified as a target for health improvement by successive governments.<sup>2,3</sup>

Improving access to health education and contraceptive services is seen as the principal way to reduce teenage pregnancy.<sup>4</sup> General practice is one source of provision of contraception, but it has been suggested that teenagers are reluctant to seek advice because of difficulty in gaining access and fears about confidentiality.<sup>5</sup> However, there is little published evidence concerning the actual use made of general practice services by teenagers who subsequently become pregnant.

We aimed to determine the extent to which teenagers who become pregnant have utilised general practice services before the pregnancy, and also whether there are differences between those whose pregnancy ends in termination (as a proxy for unintended pregnancy) and others. The results might allow identification of potential opportunities for preventing teenage pregnancy.

### Subjects and methods

We conducted a case-control study in which characteristics of cases who conceived as teenagers were compared with those of controls matched by age and practice. The study was performed in 14 general practices from the Trent Focus Collaborative Research Network.

#### Identification of subjects

Cases were registered patients who had a recorded termination, delivery, or miscarriage resulting from conception before the age of 20, between 1 January 1995 and 1 January 1998. Cases were identified from computer records, maternity books, and the knowledge of practice staff. If cases had more than one pregnancy during the study period then the earliest was selected as the index pregnancy. Date of conception was based on the date of the last menstrual period when recorded or estimated from the date of outcome.

Controls were registered patients who had no recorded teenage pregnancy. Three age matched con-

trols per case were identified from within the same practice by selecting those closest in chronological age from an ordered list. Each control could only act as a control for one case. Twin siblings were excluded.

### Data extraction

Data on demography, consultation, and contraception were extracted from medical records by a member of each practice (usually the practice nurse) after standardised training. Data on consultations were recorded for the same 12 month period before the estimated date of conception for both the case and matched controls. Data on clinical consultations were then categorised and coded by one of us (DC).

Consultations in general practice in the year before conception were classified as either related to contraception (contraception provided or evidence that it had been discussed) or not related to contraception (no mention of contraception).

Provision of contraception was recorded, both in the year before conception and also at any time before conception. Postcodes were used to estimate distance of residence from the practice premises, and Townsend score was used as an indicator of deprivation.

### Analysis

Data were entered on to an EpiInfo 6.01 database. Principal analyses and calculations of odds ratios were performed with STATA 5.0, and descriptive analyses were performed with SPSS for Windows 8.0.

Separate analyses were performed on all cases and on the subgroup of cases whose pregnancy ended in a termination, in relation to their matched controls. Conditional logistic regression analysis was used to calculate odds ratios (with 95% confidence limits) for matched case-control differences. Absolute differences in interval or continuous data were calculated between case values and the aggregate of matched control values by using Student's *t* test for normally distributed variables and Wilcoxon signed ranks test for other variables. A significance level of 0.05 was selected for the main outcomes. Multivariate conditional logistic regression analysis, incorporating Townsend scores and distance of residence from surgery, was applied to consultation variables to adjust for potential confounding.

Initial target sample size calculations were based on a 2:1 ratio of controls to cases, assuming that 20% of cases were frequent attenders compared with 10% of controls. Such a difference would be detected at a 5% significance level and 80% power with 158 cases and 316 controls. A 3:1 ratio was selected to increase the power and to allow for any shortfall of cases identified, although a shortfall did not subsequently present difficulty. The study was approved by the Trent multicentre research ethics committee and individual local research ethics committees.

## Results

Overall, 240 cases, and 719 matched controls, were identified. Overall, 70% of index pregnancies resulted in delivery, 22% in termination, and 8% in miscarriage. The median age of cases at conception was 17 years (range 13 to 19 years). Thirty four cases (14%) were less

**Table 1** Case-control differences in relation to consultations and provision of contraception (all cases). Values are numbers (percentages) unless stated otherwise

Variable	Cases (n=240)	Controls (n=719)	Odds ratio (95% CI)	P value
<b>Demography</b>				
Lives $\geq 2$ miles from surgery*	57 (24.6)	195 (29.4)	0.67 (0.45 to 0.99)	0.045
Townsend score $\geq 4$ †	89 (37.9)	189 (28.8)	2.25 (1.45 to 3.50)	<0.001
<b>Consultation in year before conception</b>				
Any health professional at least once	224 (93.3)	603 (83.9)	2.70 (1.56 to 4.66)	<0.001
Any health professional $\geq 4$ times	128 (53.3)	302 (42.0)	1.68 (1.23 to 2.30)	0.001
General practitioner	219 (91.3)	586 (81.5)	2.37 (1.45 to 3.86)	0.001
Practice nurse	56 (23.3)	170 (23.6)	0.98 (0.69 to 1.39)	0.905
Any health professional, with contraception discussed	148 (61.7)	322 (44.8)	2.15 (1.56 to 2.97)	<0.001
For any non-contraceptive reason	198 (82.5)	547 (76.1)	1.51 (1.03 to 2.22)	0.035
<b>Contraception provided at any time before conception</b>				
Ever consulted for contraception	171 (71.3)	339 (47.1)	3.32 (2.33 to 4.73)	<0.001
Contraceptive pill	156 (65.0)	301 (41.9)	2.96 (2.11 to 4.14)	<0.001
Emergency contraception	27 (11.3)	61 (8.5)	1.35 (0.84 to 2.18)	0.210
Intrauterine device	1 (0.4)	3 (0.4)	1.00 (0.10 to 9.61)	1.000
Injectable progestogens	17 (7.1)	23 (3.2)	2.36 (1.23 to 4.55)	0.010
Condoms	31 (12.9)	38 (5.3)	2.73 (1.64 to 4.54)	<0.001

Data missing for 8 cases and 55 controls\* and 8 cases and 62 controls†.

than 16 years. Forty eight cases (20%) had been pregnant at least once previously.

The median number of consultations by cases in the year before conception was 4 (range 0 to 29). Table 1 shows the proportion of cases consulting and also recorded provision of contraception both in the index year and at any time before conception. Of the 92 cases who had not consulted for contraception in the year before conception, 76 (83%) had consulted for another reason at least once and 24 (26%) had consulted on four or more occasions.

Townsend scores were available for 232 cases (97%) and 657 controls (91%). The mean score was 3.2 for cases (SD 3.4) and 2.4 for controls (SD 3.3), with the difference between cases and aggregated matched controls being significant ( $t=4.866$ ,  $df=231$ ,  $P<0.001$ ), indicating that cases were resident in more deprived areas. More cases than controls lived within two miles of the surgery, although the difference only just attained significance (table 1).

In the year before conception, cases were more likely than controls to have consulted any health professional at least once, to have consulted a general practitioner, to have consulted frequently (four or more times), and to have consulted for purposes both related to contraception and not related to contraception (table 1). After multivariate analysis, in the year before pregnancy the only significant association was in relation to consultation for contraception (odds ratio 1.78, 95% confidence interval 1.22 to 2.60;  $P=0.003$ ). Cases were more likely to have consulted for contraception at any time before conception and specifically to have been provided with oral contraception, injectable progestogens, or condoms (table 1).

Table 2 shows consultation rates and uptake of contraception by cases whose pregnancy ended in termination. Of the 27 cases who had not consulted for contraception, all but two (7%) had consulted at least once, and seven (26%) had consulted on four or more occasions in the previous year. There were no significant differences between cases whose pregnancy ended in termination and their 159 matched controls

**Table 2** Case-control differences in relation to consultations and provision of contraception (cases resulting in termination). Values are numbers (percentages) unless stated otherwise

Variable	Cases (n=53)	Controls (n=159)	Odds ratio (95% CI)	P value
<b>Demography</b>				
Lives $\geq 2$ miles from surgery*	17 (32.1)	60 (39.2)	0.68 (0.33 to 1.38)	0.280
Townsend score $\geq 4$ †	17 (32.1)	32 (21.2)	2.25 (1.45 to 3.50)	<0.001
<b>Consultations in year before conception</b>				
Any health professional at least once	51 (96.2)	139 (87.4)	3.51 (0.81 to 15.37)	0.094
Any health professional $\geq 4$ times	24 (45.3)	72 (45.3)	1.00 (0.50 to 1.99)	0.144
General practitioner	50 (94.3)	137 (86.2)	2.68 (0.77 to 9.33)	0.110
Practice nurse	7 (13.2)	34 (21.4)	0.56 (0.23 to 1.35)	0.192
Any health professional, with contraception discussed	26 (49.1)	76 (47.8)	1.05 (0.57 to 1.96)	0.874
For any non-contraceptive reason	45 (84.9)	129 (81.1)	1.32 (0.56 to 3.13)	0.528
<b>Types of contraception provided at any time before conception</b>				
Ever consulted for contraception	32 (60.4)	73 (45.9)	1.80 (0.95 to 3.38)	0.068
Contraceptive pill	27 (50.9)	64 (40.3)	1.54 (0.83 to 2.88)	0.173
Emergency contraception	11 (20.8)	12 (7.5)	3.21 (1.32 to 7.79)	0.007
Injectable progestogens	2 (3.8)	6 (3.8)	1.00 (0.20 to 5.11)	1.000
Condoms	8 (15.1)	6 (3.8)	4.53 (1.50 to 13.75)	0.004

Data missing for 6\* and 8† controls.

**Table 3** Comparison of recorded provision of contraception between cases resulting in termination of pregnancy and those with other outcomes. Values are numbers (percentages) unless stated otherwise

	Termination (n=53)	Delivery or miscarriage (n=187)	Odds ratio (95% CI)	P value
Ever consulted for contraception	32 (60.4)	139 (74.3)	0.53 (0.28 to 1.00)	0.048
Consulted for contraception in previous 12 months	26 (49.1)	122 (65.2)	0.51 (0.28 to 0.95)	0.032
Ever prescribed oral contraception	27 (50.9)	129 (69.0)	0.47 (0.25 to 0.87)	0.015
Prescribed oral contraception in past 12 months	20 (37.7)	101 (54.0)	0.52 (0.28 to 0.97)	0.036
Ever prescribed emergency contraception	11 (20.8)	16 (8.6)	2.80 (1.21 to 6.48)	0.013
Prescribed emergency contraception in past 12 months	7 (13.2)	9 (4.8)	3.01 (1.06 to 8.51)	0.031
Ever used injectable progestogen	2 (3.8)	15 (8.0)	0.45 (0.10 to 2.03)	0.376*
Ever used condoms	8 (15.1)	23 (12.3)	1.27 (0.53 to 3.02)	0.593

\*Fisher's exact test.

for overall consultation rate, consultations with a general practitioner, or consultations related to contraception or not related to contraception. Cases were less likely than controls to have consulted a practice nurse, although the difference did not attain significance. Cases resulting in termination of pregnancy were significantly more likely to have been provided with emergency contraception or condoms at any time before conception.

Consultation rates of cases whose pregnancies ended in termination were compared with those with other outcomes. There were no significant differences in terms of overall consultation rate or the proportion consulting any health professional at least once, consulting the general practitioner at least once, or consulting frequently. Cases resulting in a termination were, however, half as likely to have consulted the practice nurse than others, with seven (13%) having done so compared with 49 (26%) others ( $\chi^2 = 3.899$ ,  $df = 1$ ,  $P = 0.048$ ).

The use of contraception by teenagers whose pregnancy resulted in a termination was compared with that of other outcomes (table 3). Cases resulting in a termination of the pregnancy were less likely to have consulted for contraception and less likely to have

been prescribed oral contraception at any time but were more likely to have been prescribed emergency contraception.

## Discussion

This is the first study to compare the consultation patterns of teenagers who become pregnant with those of age matched peers. There is little published research about the uptake of services for contraception in general practice by teenagers before pregnancy. Such research is difficult to undertake and is subject to ethical constraints.

Our study involved general practices from the Trent Focus Collaborative Research Network. Although research practices may potentially provide different standards of care for teenage patients, pregnancy rates in the study practices were similar to those of other practices in the region. The proportion of pregnancies resulting in a termination in this study (22%) was lower than expected from national data (35% among teenagers aged 15-19 in 1994<sup>2</sup>) suggesting that we may not have identified all such cases, particularly if the terminations were performed in the private sector or referred directly from family planning services without notifying the general practitioner.

Our data were based solely on general practice records. This was appropriate since our interest was in the use made of general practice services. Our results therefore provide an underestimate of the total provision of contraception to teenagers because a proportion access family planning or specific teenage services. The extent of use of other services is likely to vary with locality, but one study found that 60% of pregnant teenagers had accessed services for contraception in general practice compared with 30% who had attended family planning clinics.<sup>6</sup>

### Consultation patterns before pregnancy

Our results show that most teenagers who become pregnant do access general practice for both general medical services and contraceptive advice before their pregnancy. This suggests that for most teenagers fears about confidentiality and embarrassment is less of a barrier than previously supposed.<sup>5</sup> These issues may, however, still be important for the minority who did not consult.

At least four fifths of the pregnant teenagers who had not discussed contraception had consulted for other reasons. Although these represent potential "missed opportunities" for contraceptive advice, it was not possible to identify such teenagers as a distinct "at risk" group. It has been suggested that teenagers may have a hidden agenda when consulting, which includes the desire to discuss sexual health issues.<sup>7,8</sup> However, teenagers have also been reported to have shorter consultations than adults, which provides less opportunity for raising such concerns.<sup>9</sup>

We found that teenagers who become pregnant consulted more frequently in general practice than did their peers. Most of the difference was owing to consultation for contraception, with sexual activity acting as a confounding variable. Among this group, however, consultation rates were also marginally higher overall for reasons not related to contraception. Frequent con-

## What is already known on this topic

Teenage pregnancy rates in the United Kingdom are among the highest in western Europe

General practice is a potential source of provision of contraception for teenagers but may not be fully utilised by them

## What this study adds

Most teenagers who become pregnant do access general practice in the year before pregnancy, suggesting that potential barriers to care are less than often supposed

Teenagers who become pregnant have higher consultation rates than their age matched peers, and most of the difference is owing to consultation for contraception

Teenagers whose pregnancies end in termination are more likely to have received emergency contraception before conception, emphasising the need for adequate follow up

sultation among teenagers is also associated with higher rates of psychological morbidity.<sup>10</sup> Thus general practitioners need to be aware of the complex issues that may need addressing among teenagers who consult frequently.

## Unintended pregnancy

A separate analysis was performed on cases whose pregnancy ended in a termination, as this group excludes those teenagers in whom the pregnancy was planned or wanted. Most teenagers in this group were still likely to have consulted in general practice in the year before pregnancy, and half had discussed contraception during this time.

Recorded provision of emergency contraception in general practice was associated with an increased risk of termination. Teenagers who had a termination were also more likely to have had emergency contraception and less likely to have had regular oral contraception than teenagers who had a pregnancy resulting in delivery or miscarriage. Similar results were reported by Pearson et al, who found that teenagers who requested a termination of pregnancy were significantly more likely to report having used condoms and less likely to have used oral contraception than teenagers attending antenatal care.<sup>11</sup>

Improved knowledge of, and access to, emergency contraception is often advocated as a means of reducing teenage pregnancy.<sup>12</sup> Teenagers who choose this method, however, may be more at risk of unintended pregnancy, possibly because it is a marker of "risk taking" in sexual activity. This emphasises the importance of appropriate follow up to address long term needs for contraception whenever a teenager consults for emergency contraception. It also raises questions about the possible supply of emergency contraception by agencies who are unable to provide such follow up.

We thank the practices from the Trent Focus Research Network and their staff who took part. Since this paper was written, Dave Ebdon has died.

**Contributors:** All authors were part of the project team. DC developed the original idea by MP, had major input into the study design, performed data coding and analysis, interpreted the results, and wrote the paper; he will act as guarantor for the paper. JA contributed to the design of the study, undertook the literature review, provided training for practices undertaking data collection, performed data entry, and commented on the analysis and the paper. MP conceived the original idea for the project and contributed to the design, interpretation of results, and writing of the paper. JH-C contributed to the development of core ideas, study design, data analysis, interpretation of results, and the paper. DE analysed postcode data for deprivation and spatial analysis. MM and SB commented on the design, interpretation of results, and the paper. Data collection was performed by staff in participating practices. Carol Coupland provided advice on statistical analysis.

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**Competing interests:** None declared.

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## Endpiece

### Artie Shaw's philosophy on life

Artie Shaw, composer, arranger, bandleader, and clarinet virtuoso, is now 90, living in California. His version of Cole Porter's "Begin the Beguine" made him world famous, and his 1940s original theme "Nightmare" was also widely acclaimed. His composition "Gloomy Sunday" was banned in Hungary in the 1930s, because it allegedly led to a rise in suicides among those who heard it.

I wrote to Mr Shaw and asked him for a brief message embodying his successful ageing and life philosophy.

This is what he replied: "I believe it can be summed up this way. Try to leave things a little better than you found them. Note the words 'little better'—anyone who tries to make a really major difference stands a chance of becoming a Hitler, a Stalin, or a Milosevic. As William Blake put it some 200 years ago: 'If you wish to do good, be sure to do so only in minute particulars.'"

Mr Shaw is also a writer and has published three novels, the best known of which is *The Trouble with Cinderella*.

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