Aims and objectives. To assess women’s attitudes towards the mechanisms of action of birth control methods.

Background. When addressing women’s knowledge of and attitudes towards birth control methods, researchers frequently focus on side effects, effectiveness or correct use. Women’s opinions about mechanisms of action have been much less investigated, and research is usually concentrated on the EC pill.

Design. Cross-sectional study.

Methods. Women, aged 18–49, from Germany, France, the UK, Sweden and Romania were randomly selected (n = 1137). They were asked whether they would use a method that may work after fertilisation or after implantation and whether they would continue using it after learning it may have such effects. Logistic regression was performed to evaluate the influence of certain characteristics on women’s attitudes.

Results. Almost half of women in Romania and Germany would not use methods with postfertilisation effects, while the lowest percentages were found in Sweden and in France. Regarding methods with postimplantation effects, higher percentages were found in all the countries. Highly educated women and those using a highly effective method were more likely to use methods with postfertilisation effects. On the contrary, married women, those who stated that human life begins at fertilisation and women with middle/high religiosity were less likely to consider using methods that may act after fertilisation.

Conclusions. One-third of European women reported that they would not consider using a method that may have postfertilisation effects.

Relevance to clinical practice. Given that postfertilisation effects may not be acceptable to some women, informing them of which methods may have these effects is essential to obtaining complete informed consent and to promoting women’s autonomy.

Key words: emergency contraceptive pill, family planning, informed consent, intrauterine device, mechanism of action, oral contraceptives, postfertilisation effects

Introduction

Informed consent is a commonly recognised ethical requirement in medical practice. It ensures patient autonomy and encourages the patient to take an active role in her/his health care. Some authors define it as a ‘process through which an individual arrives at a decision based upon access to, and full understanding of all necessary information from...
his/her perspective’. In this context, the term informed choice is used (Upadhyay 2001).

With respect to family planning (FP), the Cairo International Conference on Population and Development stated ‘the right of men and women to be informed about and to have access to safe, effective, affordable and acceptable methods of family planning of their choice’ (United Nations 1994). Informed choice regarding FP methods is associated with greater effectiveness and satisfaction with the method (Canto De Cetina et al. 2001, Backman et al. 2002, Nobili et al. 2007, Levy et al. 2010).

To assure that a given choice about FP methods is truly informed, women need to know about all the characteristics, factors and issues that could influence their decisions. For example, according to a study conducted in the USA, some European countries and Australia, some women would use a highly effective method even if it caused menstrual disturbances, while others would switch to another method because of that side effect (Hooper 2010). How each method works to avoid pregnancy also influences women’s choices. FP methods can act before fertilisation, after fertilisation but before implantation (postfertilisation effects) or after implantation (postimplantation effects), depending on the method. Barrier methods, fertility awareness–based methods and sterilisation work before fertilisation. Hormonal contraceptives, including the emergency contraception (EC) pill, and the intrauterine device act mainly before fertilisation, but they can also have postfertilisation effects. None of them can disrupt an implanted embryo (Larimore & Stanford 2000, Frye 2006, Stanford 2008, The ESHRE Capri Workshop Group 2008, Lopez-del Burgo et al. 2011). The mifepristone, also known as ‘RU-486’ or ‘medical abortion’, acts after implantation (DeHart & Morehead 2001). Postfertilisation and postimplantation effects could interfere with the development of an embryo, which is a source of concern for some women. In a study among Latino women in Texas (USA), those who believed that the EC pill worked mainly by preventing ovulation were significantly more willing to take it compared with those who believed that it prevented implantation (Romo et al. 2004). Another study indicated that 45% of a representative sample of Spanish women would not use a FP method with postfertilisation effects (Lopez-del Burgo et al. 2010). A higher figure (53%) was found among women from Utah and Oklahoma (USA) (Dye et al. 2005).

When addressing women’s knowledge of and attitudes towards FP methods, researchers frequently focus on side effects, effectiveness or correct use (Sundby et al. 1999). Women’s opinions about mechanisms of action have been much less investigated, and research is usually concentrated on the EC pill (Jackson et al. 2000, Gould et al. 2002, Campbell et al. 2008).

The aim of our study was to assess women’s attitudes towards the mechanisms of action of birth control methods in several European countries. We explored whether women would consider (1) using a method that may work after fertilisation, (2) using a method that may work after implantation, (3) continuing to use a method after learning it may work after fertilisation and (4) continuing to use a method after learning it may work after implantation. We also investigated which personal characteristics were associated with these opinions. According to previous findings in Spain about this topic (Lopez-del Burgo et al. 2010), we hypothesised that around 45% of European women would not consider using a method that may exhibit postfertilisation effects.

Methods

Study population

We conducted a cross-sectional study in Germany, France, the UK, Sweden and Romania, which have different sociocultural profiles and patterns of birth control use. Details of this study have been published elsewhere (De Irala et al. 2010). Spain was not included because previous research about the same topic was conducted there (Lopez-del Burgo et al. 2010).

Participants were women aged 18–49. Contraceptive use was not required for inclusion. Pregnant women or those trying to get pregnant, as well as sterile women were excluded, as their current motivations about family planning are different from potentially fertile women. Women with a sterilised male partner were not excluded as they could have sexual relationships with a different man.

The sample size required for each country was calculated assuming that 45% of women would not consider using a method with postfertilisation effects, as found in the Spanish study (Lopez-del Burgo et al. 2010). We estimated a sample size of 264 per country, taking into account a 95% confidence interval and a precision of ± 6%.

The Institutional Review Board of the University of Navarra approved the study.

Questionnaire

A 31-item questionnaire designed to capture the knowledge, beliefs and attitudes of women about mechanisms of action of FP methods was created, details of which have been
published elsewhere (Dye et al. 2005, Lopez-del Burgo et al. 2010). Briefly, the questionnaire included a picture of the female reproductive system and an explanation of the early stages of human reproduction, from fertilisation to implantation. ‘Stage 1’ referred to the period before fertilisation, ‘stage 2’ referred to the period between fertilisation and implantation, and ‘stage 3’ encompassed the period after the implantation of the embryo in the uterus. The medical definition of a pregnancy was not provided in the questionnaire. Women were then asked whether they would consider using a method which may act after fertilisation (but before implantation) or after implantation and whether they would continue or stop using a method after learning it may have such effects. We did not ask whether women would consider using a specific contraceptive method, such as oral contraceptives or intrauterine devices. Demographics, reproductive history and use of any birth control method (current or past) were also asked. There were no questions about sexual behaviour. Important findings from this questionnaire not included in this article (i.e. knowledge and beliefs about mechanisms of action of specific birth control methods) have been published elsewhere (De Irala et al. 2011, Lopez-del Burgo et al. 2012).

Native speakers, from an experienced international market research company (GFK-Emer), made translations of the questionnaire from English into local languages. They used back-translation to check the accuracy of the local versions. They also checked whether questions were intelligible and had all the possible responses. The questionnaire is available from the authors upon request.

**Sampling and data collection**

The sampling and the data collection were performed by the market research company. Age-specific recruitment quotas were determined according to each country’s official statistics in order to obtain nationally representative samples. After stratifying populations by geographical location and residential size, a computer program randomly chose census sections and routes. The researchers invited women from households to participate in the study. In Sweden and the UK, women from an internet panel set by the research market company were randomly selected and invited to participate in the study via internet. If a woman refused to enter into the study, another one with similar eligibility criteria was randomly selected, until the targeted study size was reached.

Data collection started in October and finished in December 2008. A letter requesting voluntary, anonymous participation was provided to women before they filled out the questionnaire. Computer-assisted personal interviewing method was used in France, Germany and Romania, while Web-based interviews were conducted in Sweden and the UK. Participants were not incentivised in any way.

**Analysis**

The statistical software, SPSS, version 15.0 (IBM, Chicago, IL, USA), was used to analyse the data proportions, and their 95% confidence intervals were estimated. Logistic regression analyses were used to evaluate the independent influence of various characteristics on the women’s attitudes about mechanisms of action of FP methods, specifically whether they would consider using a method that may work after fertilisation or after implantation and whether they would continue using a method after learning it may work after fertilisation or implantation.

The independent variables were age, parity, desire for future pregnancy, previous elective abortion, education (low, medium versus university), marital status (married vs. unmarried), opinion about when human life begins (at fertilisation, implantation, after implantation, no exact time, do not know), current use of a highly effective method and religiosity. According to contraceptive guidelines, hormonal contraceptives and IUD are the most effective methods, together with sterilisation (Hatcher et al. 2008). ‘Medium, high religiosity’ corresponded to women who identify with a religion, attend church more than once a month and consider faith to be an important influence in their life. Women with no religious affiliation or who identify with a religion but attend church or worship services occasionally (<1/month) or never and/or do not consider faith as an important influence in their life were classified as ‘low religiosity’.

We also explored the consistency of women’s responses. For example, if a woman would not use a method with postfertilisation effects, she probably would not use a method with postimplantation effects. We performed analyses both using the global sample and excluding women with inconsistent responses.

**Results**

**Characteristics of the sample**

There were 1137 women in the study. We selected approximately 200 participants per country because of budgetary constraints, obtaining a precision of ± 6.9%. Their characteristics are shown by country in Table 1. The highest proportion of university graduates and unmarried women was found in the Swedish sample (45.8 and 72.9%) and the lowest in the Romanian (19.8 and 26%). The highest
Table 1 Study participant characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Germany (n = 199) %</th>
<th>France (n = 202) %</th>
<th>UK (n = 203) %</th>
<th>Romania (n = 227) %</th>
<th>Sweden (n = 306) %</th>
<th>Total (n = 1137) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18–29</td>
<td>32.7</td>
<td>52.5</td>
<td>28.1</td>
<td>41.4</td>
<td>53.6</td>
<td>42.7</td>
</tr>
<tr>
<td>30–39</td>
<td>32.2</td>
<td>26.2</td>
<td>40.4</td>
<td>36.6</td>
<td>22.9</td>
<td>31.0</td>
</tr>
<tr>
<td>40–49</td>
<td>35.2</td>
<td>21.3</td>
<td>31.5</td>
<td>22.0</td>
<td>23.5</td>
<td>26.3</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low, medium</td>
<td>75.4</td>
<td>66.8</td>
<td>69.0</td>
<td>80.2</td>
<td>54.2</td>
<td>68.0</td>
</tr>
<tr>
<td>High (college, university)</td>
<td>24.6</td>
<td>33.2</td>
<td>31.0</td>
<td>19.8</td>
<td>45.8</td>
<td>32.0</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmarried</td>
<td>50.3</td>
<td>57.4</td>
<td>52.2</td>
<td>26.0</td>
<td>72.9</td>
<td>52.0</td>
</tr>
<tr>
<td>Married</td>
<td>49.7</td>
<td>42.6</td>
<td>47.8</td>
<td>74.0</td>
<td>27.1</td>
<td>48.0</td>
</tr>
<tr>
<td>Parity (No. births)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>38.2</td>
<td>66.8</td>
<td>29.6</td>
<td>30.8</td>
<td>56.9</td>
<td>40.9</td>
</tr>
<tr>
<td>1+</td>
<td>61.8</td>
<td>33.2</td>
<td>70.4</td>
<td>69.2</td>
<td>43.1</td>
<td>59.1</td>
</tr>
<tr>
<td>Desire for future pregnancy</td>
<td>28.8</td>
<td>60.5</td>
<td>30.0</td>
<td>28.6</td>
<td>50.9</td>
<td>40.7</td>
</tr>
<tr>
<td>Previous induced abortion†</td>
<td>3.0</td>
<td>15.8</td>
<td>10.8</td>
<td>19.4</td>
<td>15.7</td>
<td>13.4</td>
</tr>
<tr>
<td>Current use of a highly effective method†</td>
<td>64.3</td>
<td>65.3</td>
<td>43.3</td>
<td>26.9</td>
<td>59.8</td>
<td>52.1</td>
</tr>
<tr>
<td>Religiosity‡</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low, no religion</td>
<td>92.0</td>
<td>95.5</td>
<td>93.6</td>
<td>67.8</td>
<td>97.1</td>
<td>89.4</td>
</tr>
<tr>
<td>Medium, high</td>
<td>8.0</td>
<td>4.5</td>
<td>6.4</td>
<td>32.2</td>
<td>2.9</td>
<td>10.6</td>
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<tr>
<td>Opinion about when human life begins</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilisation</td>
<td>39.2</td>
<td>33.2</td>
<td>37.4</td>
<td>34.4</td>
<td>20.9</td>
<td>31.9</td>
</tr>
<tr>
<td>Implantation</td>
<td>21.6</td>
<td>12.9</td>
<td>18.2</td>
<td>14.5</td>
<td>11.4</td>
<td>15.3</td>
</tr>
<tr>
<td>Other†</td>
<td>39.2</td>
<td>53.9</td>
<td>44.3</td>
<td>51.1</td>
<td>67.7</td>
<td>52.8</td>
</tr>
</tbody>
</table>

*Self-reported data.
†Highly effective methods: hormonal contraceptives (oral, patch, vaginal ring, injectable and implant) and IUD (inert, copper and hormonal).
‡Low, no religion: women with no religious affiliation or who identify with a religion but attend church or worship services occasionally (<1/month) or never and/or do not consider faith as an important influence in their life. Medium, high: women who identify with a religion, attend church more than 1/month and consider faith to be an important influence in their life.
§Other: ‘after implantation’, ‘there is no exact time’, ‘I do not know’.

The percentage of nulliparous women was found in the French sample (66.8%), which also registered the highest percentage with respect to the desire to get pregnant in the future (60.5%). The majority of the overall sample had a low religiosity. Approximately, one-third of the women surveyed believed that human life begins at fertilisation (Table 1).

Use of a highly effective FP method was very common among German and French women (65%) but relatively low among Romanians (26.9%) (Table 1). Patterns of contraceptive use among countries have been described elsewhere (De Irala et al. 2011). The most popular FP methods in the five countries were oral contraceptives (OCs) (36.3%), condoms (24.1%) and intrauterine devices (IUDs) (10.9%).

Nine per cent of questionnaires had inconsistencies regarding intent to use a method that may act after fertilisation or implantation. We repeated all the analyses excluding these questionnaires and obtained essentially the same results. Therefore, we decided to present results from the entire sample to assure representativeness.

Opinions and attitudes related to mechanisms of action of birth control methods

When asked whether they would consider using a method which may work after fertilisation, 30.6% of the women in the overall sample responded ‘no’. When asked whether they would consider using a method that may work after implantation, this percentage increased to 47.8%. The highest percentages of women reporting that they would not accept the use of methods with postfertilisation effects were found in the Romanian and German samples, while the lowest in the Swedish and French samples (Table 2).

One quarter of the women stated they would stop using their current method if they were informed that it may work after fertilisation, and 44.3% reported that they would cease using it if informed that it may work after implantation. While 17.1% of women in Germany were unsure about their decision, the percentage of unsure women increased to 40.5% in Romania (Table 2). One-third of the women
Would consider using a method that may work after fertilisation?

Yes
No
Unsure/did not answer

Would consider using a method that may work after implantation?

Yes
No
Unsure/did not answer

Decision after learning a method may work after fertilisation

Continue using
Stop using
Depends how often it works like that
Unsure/did not answer

Decision after learning a method may work after implantation

Continue using
Stop using
Depends how often it works like that
Unsure/did not answer

Cause of embryonic loss*

Not important
Important
Unsure/did not answer

95% CI, 95% confidence interval of the proportion.

*Cause of embryonic loss: refers to whether it is important to distinguish spontaneous embryo losses from those that may be caused by birth control methods.

responded that it was important to distinguish, from their moral/ethical point of view, between spontaneous and induced embryonic losses (Table 2).

Using logistic regression, we assessed which of the characteristics shown in Table 1 were independently associated with willingness to use a method that may work after fertilisation or after implantation. The results are shown in Table 3.

Educational level, religiosity and beliefs about when human life begins were the three variables significantly associated with the women’s opinions about the mechanism of action of FP methods. Highly educated women were more likely to consider using methods with some postfertilisation or postimplantation effects. Women using a highly effective method were also more likely to consider using a method that may work after fertilisation, but not after implantation. Conversely, women with medium/high religiosity as well as those who consider that human life begins at fertilisation were less likely to use or continue using methods with postfertilisation or postimplantation effects. Married women were also less likely to consider using a method that may work after fertilisation or after implantation (Table 3).

Discussion

This study indicates that 31% of European women would not consider using a FP method that may have postfertilisation effects and that 48% would not consider using methods that may have postimplantation effects. Our results confirm previous findings from Spain and the USA. In the Spanish study, 45% of women reported that they would not use a method with postfertilisation effects; a full 57% said they would not use a method with postimplantation effects (Lopez-del Burgo et al. 2010). The study conducted in Utah and Oklahoma (USA) showed even higher percentages (53% for methods acting after fertilisation and 74% for methods acting after implantation) (Dye et al. 2005). Dehlendorf et al. (2010) in a study among women of reproductive age in California found that women desire more autonomy in their decisions about FP than in other health-related matters. In addition, those who highly valued
Table 3 Variables associated with women’s opinions about mechanisms of action of birth control methods

<table>
<thead>
<tr>
<th>Variables</th>
<th>Would you consider using a method that may work after…?</th>
<th>What would you do after learning a method may work after…?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fertilisation</td>
<td>Implantation</td>
</tr>
<tr>
<td></td>
<td>% yes</td>
<td>OR* (95% CI)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low, medium</td>
<td>35.9 (263/732)</td>
<td>1</td>
</tr>
<tr>
<td>High†</td>
<td>48.7 (167/343)</td>
<td>1.73 (1.31–2.28)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmarried</td>
<td>44.7 (250/559)</td>
<td>1</td>
</tr>
<tr>
<td>Married</td>
<td>34.9 (180/516)</td>
<td>0.73 (0.56–0.95)</td>
</tr>
<tr>
<td><strong>Religiosity‡</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low, no religion</td>
<td>42.7 (409/957)</td>
<td>1</td>
</tr>
<tr>
<td>Medium, high</td>
<td>17.8 (21/118)</td>
<td>0.37 (0.23–0.62)</td>
</tr>
<tr>
<td>Opinion about when human life begins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilisation</td>
<td>23.7 (83/350)</td>
<td>0.31 (0.23–0.42)</td>
</tr>
<tr>
<td>Implantation</td>
<td>40.6 (67/165)</td>
<td>0.67 (0.47–0.97)</td>
</tr>
<tr>
<td>Other§</td>
<td>50.0 (280/560)</td>
<td>1</td>
</tr>
<tr>
<td>Current use of a highly effective method¶</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>34.7 (180/518)</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>44.9 (250/557)</td>
<td>1.48 (1.14–1.92)</td>
</tr>
</tbody>
</table>

*Odds ratio adjusted for the variables shown in the table and for age, parity, previous elective abortion and desire of future pregnancy. Only statistically significant variables are displayed.

†High: college, university degree.

‡Low, no religion: women with no religious affiliation or who identify with a religion but attend church or worship services occasionally (<1/month) or never and/or do not consider faith as an important influence in their life. Medium, high: women who identify with a religion attend church more than 1/month and consider faith to be an important influence in their life.

§Other: ‘after implantation’, ‘there is no exact time’, ‘I do not know’.

¶Highly effective methods: hormonal contraceptives (oral, patch, vaginal ring, injectable and implant) and IUD (inert, copper and hormonal).

CI, confidence interval; NS, not statistically significant; OR, odds ratio.
autonomous decision-making reported higher satisfaction with the chosen method. Complete informed consent includes information not only about a FP method’s effectiveness, adverse effects or possible contraindications, but about its mechanism of action as well. It could be argued that as the postfertilisation effects of several methods cannot be confirmed beyond doubt (The ESHRE Capri Workshop Group 2008, Leung et al. 2010), the issue could be excluded from contraceptive counselling. But the postfertilisation effects of several methods cannot be completely ruled out either (Stanford & Mikolajczyk 2002, Frye 2006, Lopez-del Burgo et al. 2011). They could therefore be problematic for some women. In our study, beliefs about when human life begins, religiosity and education were associated with attitudes about this issue, but other characteristics might be found associated in other populations. As it would be difficult to identify which women could have concerns about postfertilisation effects, full disclosure to all women about these effects seems essential to assuring proper informed consent. In this context, Larimore and Stanford proposed an approach to the discussion of possible postfertilisation effects into the clinical encounter (Larimore & Stanford 2000). They suggest that FP provider might say:

Most of the time, the pill acts by preventing an egg from forming. However, women on the pill can still sometimes get pregnant. Some doctors think that the pill may cause the loss of some of these pregnancies very early in the pregnancy, before you would even know you were pregnant. Would knowing more about this possibility be important to you in your decision about whether to use the pill? (Larimore & Stanford 2000, p. 131)

We consider that this is a valid approach. The client is the one making decisions about whether specific pieces of information are important to him/her or not. A more condescending approach of informed consent in which the provider decides which information is of importance probably seems inadequate. We are not aware of published studies exploring what or how FP providers tell women about the mechanisms of action of birth control methods.

As expected, religious women and those who believe that life begins at fertilisation were less likely to consider using methods with possible postfertilisation effects. It is noteworthy that the number of women with high/medium religiosity in our study was very low, except in Romania. While beliefs about the beginning of human life are often associated with religious beliefs, this association is not always consistent. In fact, 30-3% of women with no religion or low religiosity in our study also believed that human life begins at fertilisation, in accordance with scientific data (Pearson 2002, Condic 2008). Among women with high religiosity, 57% believed so, whereas 10% believed it begins at implantation, 17.5% after implantation, and 15.5% did not know (data not shown).

Several studies have demonstrated that personal beliefs about when human life begins could shape attitudes towards FP methods, which our analyses confirmed. Results from two family medicine clinics in the USA showed that 20% of the female patients would use the EC pill only if it acted before fertilisation (Campbell et al. 2008). In another study conducted among men and women in Mexico, those who responded that human life begins at fertilisation were more likely to believe that the EC pill was an abortifacient instead of a contraceptive method because it could prevent the implantation of an embryo (Gould et al. 2002).

Women using a highly effective method when surveyed were more likely to consider using methods with postfertilisation effects. We did not evaluate the relative importance of mechanisms of action compared with other characteristics of birth control methods. It would not be surprising if some women prioritised effectiveness over mechanism of action, as effectiveness tends to be the most important factor in choosing a FP method (Grady et al. 1999, Steiner et al. 2003). Future research might shed light on how women weigh the various properties of FP methods, including mechanism of action, in making a final decision.

Limitations

Our study has limitations. Although country samples were intended to be representative, generalisations of the results need to be made with caution. The country sample sizes could have been higher to better assure representativeness. Although non-participation was not recorded, replacement was performed using pre-established criteria to ensure representativeness. But a selection bias could have happened. One could argue that women with concerns about postfertilisation effects would be more likely to participate in the study. But the contrary is also possible: those with concerns could refuse to participate because this is a sensitive topic. Therefore, we think that the possible bias could have had a minimum or null effect on the results. Besides this, characteristics found in our samples were consistent with those found in other nationally representative surveys. For example, the percentages of people identifying themselves as non-religious are high in the UK (50%), France (46%) and Sweden (41%) (DeHart & Morehead 2001), as we found in our own samples. Marital status and educational levels in our samples were also similar to other accepted European data indicating that marriage is relatively more common in Romania (National Institute of Statistics of
Romania 2010), while Sweden typically has the lowest percentage of married women among the studied countries (Statistics Sweden 2010). The proportion of university graduates in our samples were very similar to those identified by the Organization for Economic Cooperation and Development (2009). Also, in our study, 32% of the entire sample stated that human life begins at fertilisation, while 15.3% stated that it begins at implantation. These data are consistent with those from the Study on perceptions of and attitudes towards biotechnology, conducted in 9 European countries. In that study, the percentage of participants who stated that human life begins at fertilisation ranged from 26% in Holland to 52% in Italy and Poland (BBVA Foundation 2003). Finally, the patterns of birth control methods found in our sample are consistent with other European studies about contraceptive practices (Skouby 2004, Cibula 2008).

Uncertainty with respect to how well the participants understood questionnaire may represent another limitation of this study. Some of them may not have fully understood the stages of human reproduction or the mechanisms of action of FP methods. However, we found apparently inconsistent responses in only 9% of the overall sample. An example of inconsistency was a woman who would not use a method with postfertilisation effects and stated that she would use one with postimplantation effects. We repeated the analyses excluding these respondents and obtained practically the same results. Although apparent inconsistencies were not frequent, approximately 25% of the sample responded ‘unsure’ as to whether they would consider using of a method with postfertilisation effects. Figures were higher when asked about the decision of continuing using a method after learning it may have postfertilisation effects. The questionnaire does not allow us to differentiate whether this uncertainty was due to a limited understanding of the issues or whether it was simply uncertainty about attitudes. Although the question was accompanied by a graphical depiction of human reproduction, general lack of knowledge regarding human reproduction could have limited how well respondents understood the information provided. On the other hand, it is possible and even likely that many women were undecided about whether a FP method’s postfertilisation effects would pose ethical problems for them.

Besides these limitations, our study also has several strengths. This study was conducted in representative samples of five European countries. The same questionnaire was implemented and self-administered in the five countries, and thus comparisons among countries were possible.

In the questionnaire, we did not specify when human life begins nor explain what were the mechanisms of action of any particular birth control method, in order to not influence in women’s responses. In addition, we also avoided the terms ‘abortion’ or ‘abortive’, using less value-laden terms such as embryo loss or postfertilisation/postimplantation effects.

Conclusion

Approximately one-third of women from five European countries reported that they would not consider using a FP method that may have postfertilisation effects. Educational level, religiosity and personal beliefs about when human life begins were associated with this attitude. As postfertilisation effects may not be acceptable to some women, full disclosure about methods that may act in this way is essential to obtaining completely informed consent.

Relevance to clinical practice

Hormonal contraceptives and intrauterine devices work mainly avoiding fertilisation, but they may sometimes impair the implantation of an early embryo. Postfertilisation effects of these birth control methods may not be acceptable to some women, especially to those who consider that human life begins at fertilisation. Therefore, communicating which methods may have these effects is essential to obtaining complete informed consent and to promoting women’s autonomy in family planning.

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Contributions

Study design: CLB, RTM, JI; data collection and analysis: CLB, RT, JI and manuscript preparation: CLB, RT, JI.

Conflict of interest

The authors declare that they have no conflicts of interests.
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