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Opinion: Natural family planning and the management of infertility

Abstract Reproductive behaviour in modern western society has changed dramatically in the last two decades. Parenthood is now well planned. If planned pregnancies do not occur as expected, early infertility care is often demanded with the risk of over-treatment. Live birth rates in untreated subfertile couples reach nearly 55% in 36 months. During this period, self-monitoring with natural family planning (NFP) methods may be all that is necessary, especially in couples with unexplained infertility.

Keywords Natural family planning · Infertility treatment · Natural fecundability · Ovulation detection · Fertile window

Introduction

There is a new debate about how to investigate and treat infertile couples [2, 11]. Spontaneous pregnancy rates and the success-rates of modern infertility treatment should be compared to avoid strategies causing either infertility over- or under-treatment. Both, natural fertility and the success-rates of infertility treatment have been subject of prospective studies recently [6, 8, 25]. In our department for gynaecological endocrinology and reproductive medicine and our Institute for Natural Family Planning, we integrated natural family planning (NFP) methods and assisted reproductive techniques (ART) for the balanced management of infertility.

Reproductive behaviour in western society has changed dramatically in the last two decades [17]. Parenthood is planned around the careers of both partners and family size has decreased significantly. Twenty years of contraception may precede a first pregnancy. Thus, less than 25% of a woman's fertile years may be set aside for reproduction and these later years are the less fertile ones. So methods and time of contraception must not compromise future fertility.

If, after long postponements, planned pregnancies do not occur, couples soon seek advice about infertility care [22]. In some centres, early resort to assisted reproductive techniques (ART), such as IVF, have moved the focus away from investigation [2]. Interventions such as IVF as first-line treatment may represent over-treatment and may expose women unnecessarily to medical complications (e.g. multiples and ovarian hyperstimulation syndrome) and unnecessary expense [27]. On the other hand, late interventions may represent infertility under-treatment.

Reproductive medicine needs to address the question of how to avoid over-treatment without decreasing a couple's chance of pregnancy. Some people call this adapted infertility care.

Probability of conception

Natural fecundability is in the focus of interest again. Recently the results of a very interesting prospective study of daily and cycle fecundability were published by Colombo and Masarotto [6], who worked at a total of 7,017 menstrual cycles (Natural Family Planning cycle charts) contributed by 881 women, 105 of whom were women from our long-term study of natural family planning in Germany (Table 1).

Their figures agree with our own [4] and those of Dunson et al. [8], except for higher rates on day 0. Colombo and Masarotto also showed that the chance of pregnancy is about 10% higher for days –4 to –2 in multigravida when compared with nulligravida.

Interestingly, the literature contains little prospective data on spontaneous cumulative pregnancy rates. Juul et al. [20] presented retrospective data on the "time to pregnancy" rates (TTP, Table 2) showing that half of the con-

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Table 1 Chance of pregnancy in 3,175 unselected natural cycles (European centres, Colombo and Masarotto [6]). There were 434 pregnancies. Day 0 denotes the basal body temperature shift (*BBT*)

−8	−7	−6	−5	−4	−3	−2	−1	Day 0, BBT	+1	+2
0.003	0.014	0.027	0.068	0.176	0.237	0.255	0.212	0.103	0.008	0.035

Table 2 Cumulative time to pregnancy according to Juul et al. [20] (1999), retrospective data on 3,438 pregnancies from different European countries

≤3 months	≤6 months	≤12 months	≤24 months
54.5%	71.5%	83.9%	91.2%

ceptions occurred quite early in the first 3 months. Just now the results of another European TTP study among fertile couples [19] were published with comparable figures for the number of months of attempts to pregnancy. But again, this data is only retrospective and gives not a real estimation of TTP because infertile women are excluded.

Zinaman et al. [29] prospectively studied 200 unselected, presumably fertile couples trying for a pregnancy over 12 menstrual cycles. The couples were told to have intercourse around the predicted day of ovulation. Of the couples, 82% conceived during the study period. The maximal conception rate was about 30% in the first two cycles and decreased quickly after that.

Interim results of our own prospective study with users of Natural Family Planning methods show the highest pregnancy rates in the first four cycles. The cumulative pregnancy rates at one, three, six and 12 cycle(s) were 17%, 44% 66% and 82% for unselected couples (publication in preparation). Colombo and Masarotto (1997, unpublished data) found an exponential decrease in conception probability per cycle in the first 3 years.

The follow up of subfertile couples with a history of more than 1 year of unprotected intercourse and no treatment is important. Snick et al. [24] found that couples with a history of 1 year of subfertility still have a cumulative live birth rate of 52.5% at 36 months. The cumulative live birth rate was highest in couples with unexplained infertility and low for severe male, tubal and ovulation defects. Prognostic factors related to higher cumulative pregnancy rates were duration of infertility <24 months, a previous pregnancy in the same partnership and a female age <30 years (multiplication factors of 1.4–1.5). Gleicher et al. [12] reported a cumulative pregnancy rate of 19.9% after 12 months in an infertile population. Collins et al. [5] and Hull et al. [18] published comparable results.

When talking about the dangers of over-treatment, we should compare these spontaneous pregnancy rates with the results for invasive infertility treatment like IVF. Stolwijk et al. [25] found that the cumulative probability of ongoing pregnancy after IVF/ICSI for five cycles (1,315 patients) was 54.5% (95% CI 50.8–58.2). The introduction of ICSI made no obvious differences to the different subfertility diagnostic subgroups. Even the group of patients with unexplained infertility had no higher cumulative probability of pregnancy compared to the other subgroups. Only women with secondary infertility had a significantly higher cumulative probability pregnancy rate in the first two IVF cycles. A women's age being below 35 is the most important factor for a higher cumulative pregnancy rate in an IVF program. Other authors have found comparable results [7, 26].

Integrating natural family planning (NFP) methods and assisted reproductive techniques (ART) in management of subfertile couples

Generally, a couple with a history of unexplained infertility for 1 year (woman's age <35) has a similar probability of achieving a pregnancy with and without treatment.

Couples seeking advice for an infertility problem of more than 1 year's duration despite regular intercourse should be investigated as follows: (a) day 3–5 FSH, LH, TSH and Prolactin; (b) day <last cycle length minus 14>ultrasound for follicular growth, assessment of endometrial development and cervical index according to Insler; (c) an ovulatory phase post-coital test (PCT); (d) 6 and 8 days later, a blood sample to measure estradiol and progesterone levels; and (e) semen analysis if there is an abnormal PCT. Follicular phase hystero-salpingo-sonography (HyCoSy) may also be performed to check tubal patency. All this investigation takes less than two cycles and can be performed by general gynaecologists. Division into subgroups with a good prognosis to conceive spontaneously (woman's age <35 and history of infertility less than 3 years, positive PCT [11]), or a poor prognosis (tubal pathology, oligo-amenorrhoea, oligoazoospermia, age >35, infertility for more than 3 years) is possible. An advanced infertility work-up, which includes laparoscopy and hysteroscopy, endocrinological tests, advanced ultrasound and in-vitro tests of sperm/cervical mucus interactions [10], together with consultation with a reproductive gynaecologist and andrologist, as well as ART may be offered to the couples with a poor prognosis (Fig. 1).

Couples with no tubal occlusion, no oligo-amenorrhoea, no oligoazoospermia, a woman's age <35 and a fertility problem of less than three years may be advised to wait as they have a reasonable good chance of con-

Fig. 1 Flow-chart of the integrated concept of NFP and ART in work-up and treatment of subfertile couples. Further explanation in the text. *CC* contraception
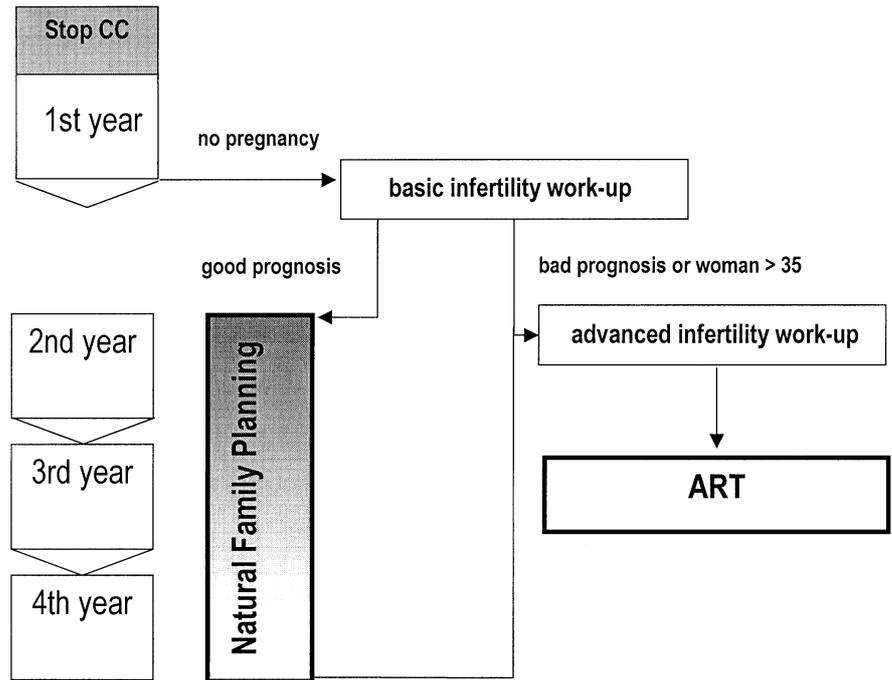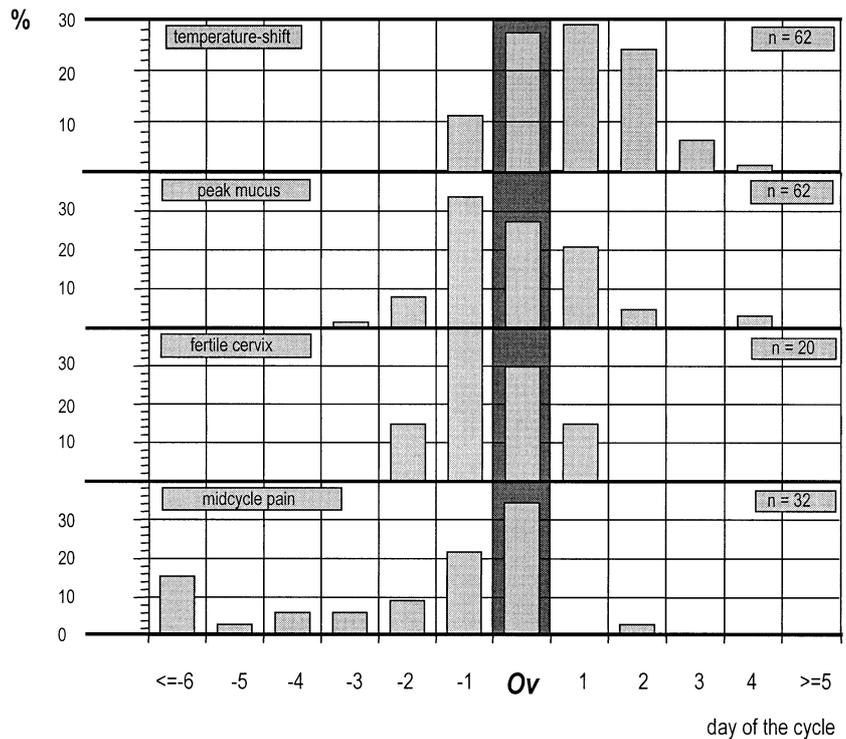
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      Stop CC
      ────────
      1st year          no pregnancy
                    ──────────────────►  basic infertility work-up

      good prognosis                        bad prognosis or woman > 35

      2nd year                              advanced infertility work-up
                     Natural Family Planning
      3rd year                                        ART

      4th year
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Fig. 2 Behaviour of temperature-shift, peak mucus, fertile cervix and midcycle pain in relation to day of ovulation

ceiving spontaneously in the next few months, during which they should optimise the time of intercourse by recording of basal body temperature (BBT) and observing cervical mucus changes [9, 13].

BBT and cervical mucus are, of course, efficiently used in NFP as part of the symptothermal method (STM) for contraception and, unlike Guida et al. [16], we proved them to be of sufficient accuracy for reliable ovulation detection and indeed for diagnostic purposes.

At our Institute for Natural Family Planning at the University of Düsseldorf, Germany, we have been collecting NFP cycle charts on a prospective basis since 1982 and have more than 30,000 NFP cycles from 1,477 women.

We examined 49 women [13] in a prospective study using the symptothermal method (STM) of NFP with additional monitoring of their cycles by daily transvaginal ultrasound and daily measurement of urinary LH (87 cycles in all, Fig. 2). In 81% of the cycles, the temperature
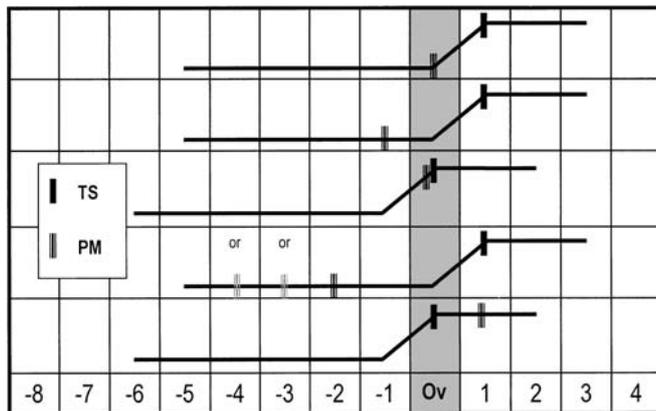
Fig. 3 Ovulation detection by peak mucus (*PM*) and temperature shift (*TS*). The first three situations are the most frequent (~80% of all cycle charts) with self-observed ovulation occurring in nearly 90% of the cases within 1 day around objective ovulation

shift (TS) occurs on or within 2 days after objective ovulation (objective ovulation +0.92 [±1.17] days). In 82%, the peak mucus day (PM, last day of highly fertile type mucus) occurs within 1 day around objective ovulation (objective ovulation –0.11 [±1.31] days). In only 11% of our cycles did the temperature shift start on the day before objective ovulation. Like Guida [16], we found the peak mucus on the day after objective ovulation in 21% of our cycles. However, to detect ovulation more precisely, we recommend the use of both markers of fertility as required by the STM [14]. Ovulation should occur between peak mucus and temperature shift. With very simple rules (Fig. 3), self-observed ovulation and objective ovulation occur on the same day in 40% of the cycles. In 89% of the cases, self-observed ovulation was within one day around objective ovulation.

Unlike Guida [16], our procedure offers sufficient accuracy to determine ovulation and the fertile window. Reliable ovulation detection is necessary for the diagnosis of retarded follicular growth, luteal insufficiency or anovulation. A predictive marker of fertility is the onset of cervical mucus secretion [8, 13]. If not used for contraception, the end of the fertile period is on day 2 of the higher temperature phase. If used for contraception, the end of the fertile period is reached on the evening of the third day of the higher temperature, according to the STM rules (one day added for safety reasons).

Discussion

We incorporated our experiences with NFP into our standardised investigation of infertility (Fig. 2). In Germany, initial infertility investigations are done by general gynaecologists in private practice. They indicate further diagnostic steps and treatments. ARTs are often requested by well-informed patients so that IVF can be the first-line treatment [21], bringing possible early success with all its attendant risks and high costs. It is sometimes very difficult to get patients with infertility problems to wait unless they are informed in detail about their prognosis, the proposed pattern of investigation and treatment and also alternative ways of becoming parents [23].

A critical review of infertility investigation was published by Balasch [2]. He pointed out the danger of false-positive results and following unnecessary over-treatment. There is a need for prognosis orientated infertility investigation and care. Snick et al. [24], Bonde et al. [3], Baird et al. [1] and Balasch [2] and others earlier summarised relevant prognostic factors. We recommend simple, reliable and cheap initial investigations for couples with the woman's age <35 and a history of infertiltiy of less than 3 years. With a good prognosis, positive PCT [11], day 3–5 FSH <10, ovulation detection by temperature-shift or normal estradiol/progesterone-ratio 6–8 days before expected menstrual bleeding, patent tubes in the hystero-contrast-sonography and a cycle length <35 days the couples should be counselled in detail and, if appropriate, should start or continue with effective self-observation of the cycle (NFP, fertility awareness) best after a NFP training course. Fertility awareness with NFP is also possible after discontinuing oral contraceptives [15]. This kind of self-care optimises conception probability by correctly detecting the fertile window [6, 28]. But NFP offers more. Self-responsibility is important to diagnosis and treatment. Couples learn how to identify luteal insufficiency, abnormal bleeding patterns, dysmucorrhoea or anovulation. They may then switch earlier to further diagnosis and treatment. With pathology (tubal occlusion, oligo-amenorrhea, oligoazoospermia, age >35) or more than 3 years of infertility, a switch to advanced infertility investigations by a reproductive gynaecologist and an andrologist is necessary to determine whether or not invasive treatment (ART) is necessary now.

"Protection through anonymity" is of importance. For many subfertile couples, NFP offers fertility awareness especially if they do not want early interventions by others. We, therefore, aim to counsel couples very early on about the possibilities of NFP methods – both for contraception and for reproduction.

Conclusion

Natural family planning methods are a valuable tool in managing infertility, especially in couples with unexplained infertility, so as to avoid over- and under-treatment.

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