

How effective is Brief Smoking Cessation Counseling in Infertile Couples?

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Abstract

Objective: Infertility is an important social concern. Environmental factors such as smoking and tobacco consumption can affect sperm and follicular function and infertility. Smoke cessation reduces its complications and makes infertility treatment more effective which motivates and encourages infertile smokers to consider quitting. The aim of current study was to assess brief smoking cessation counseling efficacy in infertile couples referring to Avicenna center.

Materials and Methods: This is a Descriptive cross-sectional study. Smokers referred to Avicenna infertility clinic with complain of primary infertility during 2008–2009 were studied. Data were collected through questionnaire. Patients received tobacco cessation brief advice and educational material package of ill effects of tobacco consumption on general health and infertility. Success in quitting was assessed 6 months after the first visit.

Results: Seventy cases were studied with mean age of 36.45 ± 6.3 which 68(97.1%) were male. The mean of smoke consumption duration was 17.78 ± 7.49 and the mean duration of infertility was 5.56 ± 4.0 year.

Forty one individuals (59.4%) had mild nicotine dependence. Mean knowledge level about tobacco harms was 0.57 ± 0.79 (from total of 4 points) and attitude mean was 18.50 ± 2.95 (from total of 24 points). Estimating quit success rates, 41 individuals (63%) quitted but it was unrelated to cessation factors.

Conclusion: It seems that according to high motivation of this group, smoke cessation brief advice and increasing knowledge through educational package is effective. It is recommended that smoke cessation brief advice and knowledge increment to be added to infertility treatment program.

Key word: Smoking, Cessation, Brief advice, Infertile

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Introduction

At present more than 10 million smokers reside in Iran and more than 1/4 of men (27.3%) and 3.4% of women are smokers. Tobacco consumption is harmful to gen-

eral health and maybe the most inflicted harm. Cigarette smoke contains 4000 substances with antigenic, mutagenic, carcinogenic and anti cellular effects.

Smoking can produce illness with several mechanisms. Among the most common tobacco related conditions are atherosclerotic cardiovascular disease, cancers, COPD, cerebral vascular incidents and decreased fertility (1). Nowadays more attention has been given to smoking and infertility and many studies have evaluated it across the world in both men and women.

Smoking can interfere with fertility in men and women. Regular smoking in men can decrease sperm quality and motility and decrease fertility. It also increases impotency. Also, smoking in fathers usually causes second hand exposure to women and children. Smoking in women also can cause infertility and decrease success of its treatment. Smoking also can interfere with fertilization and increased risk of extra uterine pregnancy and fetal distress (2).

Smoking in men can decrease sex hormone functioning, decrease erection, reduce the ability to have family and a suitable marital relation. It also decreases quality of sperm and treatment success for infertility and in reverse smoking cessation can improve fertility, potency and sexual desire. Substances in tobacco can enter testicular circulation and effect sperm parameters and quality. It also can influence the next generations by oxidative properties and DNA breakage mechanisms (3).

In women smoking decreases fertility and fertilization (4). Nicotine can decrease follicular cellular growth by increasing apoptotic cell death (5) and chemical substances in cigarettes can affect fallopian tube anatomy and function (6). Smoking can influence women reproduction by various mechanisms such as affecting the period, fertility, causing cancers of the reproductive organs and early menopause (7).

Amount of smoking has been shown to be important in infertility such that even smoking half a pack daily in women has been significantly associated with infertility (8).

A study by family planning specialists at Oxford University has shown that quitting smoking normalizes fertility (9).

The reversibility of smoking effects and dosage influence on fertility and willingness of infertile individuals to consider treatment provides opportunity to consider cessation counseling (10).

Cessation strategies vary from a few minutes of physician counseling to intensive cessation program. Several evidences have confirmed efficacy and sui-

ability of cessation brief advice and educational package and many of patients have quitted through these two ways (11).

Recommended cessation approach in infertility includes few minute counseling, education and encouragement to quit during infertility treatment sessions depending on patient readiness. Even educational packages have had success but some studies recommend combined use with an intervention cessation method (10).

In meta analysis studies on smoking cessation brief advice efficacy in 31000 smokers with 6 month follow up, it has been shown that short counseling by treating physician can significantly increase cessation compared to no counseling (RR=1.66, 0.95 CI 1.42–1.94). Also, no significant difference was seen between brief advice and intensive cessation intervention (12). Since cessation is important in fertility treatment, this study was planned to evaluate smoking cessation with brief advice and educational package efficacy in infertile smokers referred to Avicenna infertility clinic.

Materials and Methods

This was a Descriptive cross-sectional study. All daily Smokers with primary infertility complain referred to Avicenna infertility and recurrent abortion clinic from December to March 2006 were included until sample size needed was achieved. Demographic information was collected using questionnaire.

The Fagerstrom test was used to evaluate nicotine dependency. It has 6 questions including lighting cigarette in the morning, daily consumption rate, intermittence, best cigarette and influence on smoking habit with illness and in banned locations. Total possible score is 10 with 0–3 consistent with mild dependence, 4–6 moderate and 7–10 severe dependence to nicotine. Knowledge and attitude were evaluated with standard questions. Knowledge questions have four possible choices (with score of 1–4) and six attitude questions are based on a ladder model from strongly agrees to strongly disagrees (scored from 1–24).

Positive Knowledge score on 0, 1, 2 or more than 2 questions are considered very low, low, moderate, and well levels of Knowledge.

Of the 6 opinion questions, positive response to 1 or 2, 3 and 4, and more than 5 questions are considered unacceptable, moderate, acceptable and well.

In the first infertility treatment session, brief counseling to quit by trained personnel was provided to the patient and his partner and educational package about harms of tobacco consumption on general health and

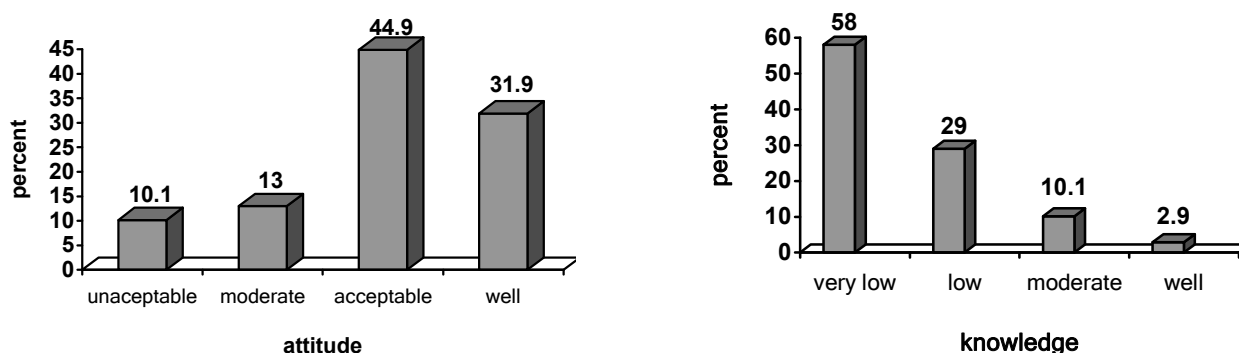


Figure 1. Distribution of knowledge level and attitude about tobacco harms in smokers referred to Avicenna Infertility Clinic

fertility was given to them.

Quit success was evaluated 6 months after the first visit and quit was considered no smoking during these period of time.

Ethical considerations were privacy of information, explanation of study purpose and methods and consent of patients. Information collected was and analyzed using SPSS 16 software with *t*- and Chi-square, Mann-Whitney and logistic-regression tests. Significance level was chosen at $\alpha=0.05$.

Results

In this study, 70 individuals participated in counseling. Age range was between 22–55 years and mean age was 36.45 ± 6.3 years and 68 participants (97.1%) were men. Time of infertility among participants varies from 1 month to 29 years with mean of 5.56 ± 4.0 years. Smoking duration ranged 1 to 36 years and mean was 17.78 ± 7.49 years.

Distribution of education level and number of cigarettes smoked per day among smokers referred to Avicenna Infertility Clinic is shown in table 1. More than half of participants (47 individuals, 68.1%) started smoking one hour after waking up, 14 (20.2 %) within 5–60 minutes after waking up and 8 (11.6 %) individuals within 5 minutes of waking up.

Mean dependency to tobacco among participants (scored 0 to 10) was found to be 3.37 ± 2.9 , and this included 41 (59.4%) individuals with mild dependence, 14 (20.3%) with moderate and 14 (20.3%) with severe dependence.

Mean score for Knowledge level about tobacco harm was 0.57 ± 0.179 (from total 4) and mean attitude score on tobacco harm and control was 18.50 ± 2.95 points (from total of 24) (Figure 1).

Predicting their cigarette use in coming 5 years, 10

individuals (14.3%) noted they will continue to smoke, 18 (25.7%) noted possibility of smoking and 26 people (37.1%) noted they will probably quit and 16 individuals (22.9%) noted they will definitely quit.

In this study, 41 participants (63.10%) were successful in quitting but 24 individuals (36.9%) did not succeed to do so. Five individuals were excluded from statistical analysis due to not being accessible after 6 month of treatment session.

Influence of age, gender, education level, number of cigarettes smoked and infertility duration were evaluated on quit success, but there was no significant correlation between them and quitting success ($p = 0.46$, $p = 0.52$, $p = 0.66$, $p = 0.87$, $p = 0.57$) (Table 1).

The age starting to smoke and duration of smoking were on the average 18.27 ± 3.35 and 17.69 ± 7.40 years respectively in quitters and 19.72 ± 5.11 and 18.12 ± 8.30 years in failed group, but significant correlation was not shown ($p = 0.24$, $p = 0.85$).

Also there was not significant correlation between successful cessation and knowledge, attitude and predicting smoking quit in the next 5 years ($p = 0.44$, $p = 0.42$, $p = 0.22$) (Figure 2).

Discussion

Infertility is one of the important social concerns as studies have shown that one out of four couples visit a physician for infertility. Many environmental factors such as smoking, nicotine use and genetic factors are influential on decreased sperm function and infertility. Smoking also affects fertility in women.

A study has been done including 4104 couples wishing to have children and strong correlation was found between decreased fertility and smoking (11). It has been shown that 13% of infertility in women is associated with smoking (13).

Table 1. Distribution of education level and number of cigarettes smoked per day among smokers referred to Avicenna Infertility Clinic

		Quitted n (%)	Failed n (%)
Education	Under diploma	15 (37.5)	10 (41.2)
	Diploma	16 (40)	7 (29.2)
	Over diploma	9 (22.5)	7 (29.2)
	Total	40 (100)	24 (100)
Number of cigarette used per day	<10	24 (58.5)	12 (52.2)
	10–30	6 (14.6)	4 (17.4)
	>30	11 (26.8)	7 (30.4)
	Total	41 (100)	23 (100)

A meta analysis study on smoking effects on infertility treatment has shown that smokers need IVF twice as much as nonsmokers and the latter is more significant among older women trying to get pregnant (10).

Women who are smokers on the average have had three times smoke cessation attempts before they present to infertility clinic; Yet, only 18% of them have been advised on quitting by their caring physician (14).

Physicians treating infertile couples have opportunity to help their patients also to quit smoking. In fact, smoking cessation is considered as an important and effective part of infertility treatment (10).

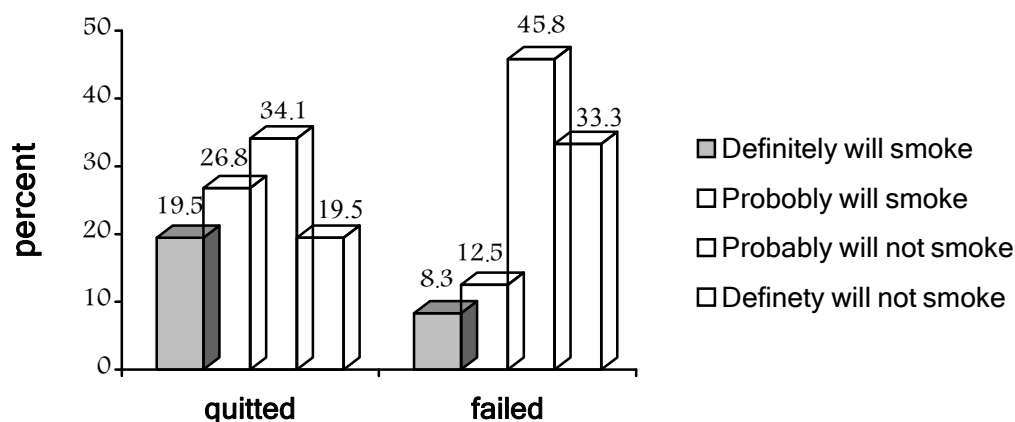
The physician can be encouraging to the patients regarding quitting by educating them about the risks of association of infertility with smoking and the possible irreversible nature, if smoking is stopped for a year (15).

Simple and inexpensive methods have been effective in quitting smoking and have increased the rate of quitting from a baseline of 0.04 to 0.24 (14). In this

study also, simple method of short cessation counseling and provision of educational package on harms of smoking on health and fertility has increased quitting by a considerable rate of 63% compared to short counseling of patients in regular clinic to quit which has increased the rate of quitting by 2.5–5% (16, 17).

Other studies have also supported short counseling as a suitable and useful method for quitting (12, 14) which was agreed with in this study. Although success rate was higher than regular individuals which can be related to higher motivation among infertile people to quit, education regarding harms of tobacco or involving patient and his partner in the counseling and cessation.

On another study on infertile couples by Huges and colleagues where similar methodology of short counseling has been applied, cessation increased from 0.04 to 0.24 (12 months after quitting was advised) (14) also supporting effectiveness of the short counseling method. Mean age and number of cigarettes smoked in our study and the one by Huges were similar (14), but

**Figure 2.** Distribution of quit prediction in next 5 years in smokers referred to Avicenna Infertility Clinic.

age smoking had begun in this study was 4 years older than in the study of Huges (14.93 years) which can be related to the taboo associated with early age smoking in our country. Time of infertility and quit success rate in this study were also twice in comparison to the population in the study of Huges which might be associated with increased time of infertility and increased motivation to get pregnant. Of course further studies are recommended.

Regression analysis of other studies, has shown education level and confidence in quitting has been correlated with quit success (14) which was not statistically significant in this study.

Conclusion

This study supports short smoking cessation counseling and shows that provision of educational package is readily possible by treating physician or other health care workers in busy infertility clinics and it is effective on smoke cessation.

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References

1. Doll R, Crofton J. Tobacco and health. *Br Med Bull* 1996; 52: 1–227.
2. Berthiller J, Sasco AJ. Smoking (active or passives) in relation to fertility, medically assisted procreation and pregnancy, *J Gynecol Obstet Biol Reprod (Paris)* 2005; 34: 3S47–3S54.
3. Peate I. The effect of Smoking on the reproductive health of men. *Br J Nurs*. 2005; 14: 362–6.
4. Wentz Ac. Cigarette Smoking and infertility. *Fertil contracept* 1986; 46: 365–7.
5. Talbot P, Riveles K. Smoking and reproduction: The oviduct as a target of cigarette smoke. *Reprod Biol Endocrinol* 2005 ; 3: 52.
6. Sajdak S, Witczak K, Sroka L, Samulak D.. Smoking and female reproductive health, *Przegl Lek*. 2005; 62: 1154–8.
7. Mehran A. et al, the toxic effect of seminal plasma from smokers on sperm function in non-smokers. *Zhonghua Nan Ke Xue* 2005; 11: 647–51.
8. Bolumar F, Olsen J, Boldsen J. Smoking reduces fecundity; a European multi center study on infertility and subfecundity: the European study Group on Infertility and subfecundity. *Am J Epidemiol* 1996; 143: 578–87.
9. Howe G, westhoff c, vesseg M, Yeates D. Effects of age, cigarette smoking and other factors on fertility: findings in a large prospective study. *Br Med J* 1985; 290: 1697–700.
10. The practice committee of the American Society for Reproductive Medicine, Smoking and infertility. Optimizing natural fertility. *Fertile Steril* 2008; 90: S1–6.
11. Lancaster T, Stead LF. self-help intervention for smoking cessation. *Cochrane Database Syst Rev* 2005 20; CD 001118. Review.
12. Stead LF, Bergson G, Lancaster T. Physician advice for smoking cessation, *Cochrane Database syst Rev*. 2008 ;6: CD 000165. Review.
13. Augood C, Duckitt k, Templeton AA. Smoking and female infertility: asystemic review and met analysis. *Hum Reprod* 1998; 13: 1532–9.
14. Hughes EG, lamont DA, Beecroft ML, Wilson DM, Brennan BG, Rice Sc. Randomized trial of a Stage-of-change Oriented smoking cessation intervention in infertile and pregnant woman. *Fertil steril* 2000, 74: 498–503.
15. Hughes EG, Brennan BG. Does cigarette smoking impair natural or assisted fecundity? *Fertile steril* 1996; 66: 679–89.
16. Silagy C. physician advice for smoking cessation. *Cochrane Database Syst Rev*. 2000; CD 000165.
17. Studd J, Andrews G. Woman's sexual health, Third Edition, Elsevier, p 52.

