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Study of Contraception Status of Female Diabetic Patients in Childbearing Years

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Abstract: The incidence of type 2 diabetes in women in childbearing ages was increased dramatically in the last decade. To minimize the risks of maternal and fetal complications attributed to unintended conceptions, standard care for all women with diabetes in this age group should include education about the risks and use of effective contraception. This study was planed to illuminate the status of contraception in our region in diabetic population. This cross sectional study was performed in a group of 200 married sexually active premenopausal diabetic women who have been referred for periodic visit to Endocrine and Diabetes clinic of Tabriz University of Medical Sciences. Face to face interviews were performed by female interviewer. Questions were asked about their awareness and practice of their contraceptive methods and risks of pregnancy in diabetes. Forty two percent of previous conceptions were unwanted. Fifteen percent of diabetic females in childbearing years did not use contraceptive methods. Contraceptive methods commonly used, in the order of frequency, were Tubal Ligation (TL), coitus interrupts, condom, Low Dose (LD) contraceptive pills, Intrauterine Devices (IUD), vasectomy, Depot Medroxy Progesterone Acetate (DMPA) injection and the use of calendar. The knowledge of these patients about the risks of pregnancy during diabetes, contraceptive methods, management of diabetes during pregnancy and suitable blood glucose for pregnancy were generally low. There isn't enough knowledge and proper practical behavior about birth control in diabetic women of childbearing ages. The education of patients in this field is felt to be mandatory.

Key words: Diabetes mellitus, pregnancy, contraception

INTRODUCTION

Diabetes Mellitus (DM) is the most common metabolic disorders of the human being. More than 246 millions the world (Diabetes Atlas, 2006) and 3-4 millions in Iran (Esteghamati, 2007) have DM. Most of the cases remain unknown. As life styles change at today's industrial societies, the age of diabetics is decreasing gradually (2007, http//www.diabetes.org/diabetes-statistics/prevalence.jsp). The number of women with type 2 diabetes mellitus in child-bearing ages is quickly increasing. With improvement of diabetes care, the number of women with type 1 diabetes that recessives to childbearing ages is also increasing.

Diabetes and pregnancy both have mutual effects to each other. In order to prevention of unwanted pregnancy and its complications, familiarity with contraceptive methods has significant importance for women in reproductive years. Ideal metabolic control prior to and during pregnancy will decrease maternal and fetal mortality and morbidity rates (Rosemary Temple *et al*., 2002). In this way prevention of unplanned pregnancy has crucial importance.

In regular visits the majority of female diabetic patients avoid to discuss about their birth control conditions due to some cultural restrictions. In our region information about contraception status of diabetic population is quite low. In this research, we studied birth control methods use and awareness of female diabetic patients in reproductive ages, through direct interviews.

MATERIALS AND METHODS

This descriptive-cross sectional study was carried out in Endocrine and Diabetes Clinic of Sina Medical Center-Tabriz, Iran from the December 2006 until the

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June 2007. This outpatient clinic is the refereeing centre of a large number of diabetic patients of Tabriz and its suburbs. Two hundred married premenopausal diabetic women were questioned face to face by a female interviewer using a questionnaire (consisting of general identification, diabetic complications, unwanted pregnancies, pregnancies outcomes, perinatal complications, usage of contraceptive methods and some questions about their awareness of this issue). The collected data were analyzed by SPSS version 11.2. The results expressed as frequency and percentage.

RESULTS

In studied population, in order of frequency, 34% were between 43-47 years old, 26.5% between 38-42, 15% between 33-37, 10% between 28-37, 8.5% over 47, 5% between 23-27 and finally 1% were between 22-28 years of age (Fig. 1). Total 20.5% of subjects had been married for 20-24 years and 1.5% for over 32 years. About 71.3% of these patients were full sexually active.

About 65% of the patients had diabetes for fewer than 6 years and 2% had it for over 18 years. The history of chronic complications of DM was positive in 13.1% of study population. Peripheral neuropathy was the most common complication (38.2%).

Conception after detection of diabetes had been occurred in 28.5% of subjects that 42.1% of them were unwanted. The occurred pregnancies in 44.3% of occasions were led to live births, 13.6% of them were ongoing and the rest (42.1%) had problems like abortion, fetal and neonatal death (Fig. 2). Cesarean section was performed in 64.1% of deliveries; the rest of women had been delivered by vaginal route. In 38.5% of live births there were postnatal problems such as neonatal jaundice and hypoglycemia. Macrosomia (birth weight above 4 kg) was a problem in 35.8% of cases.

Some types of contraceptive methods had been used by 85% of patients. A significant proportion (15%) of interviewed females reported that they have not use any method despite absence of plan for pregnancy in near future. Figure 3 illustrates the frequency of different birth control methods used by diabetics in childbearing years. Tubal obstruction was the commonest measure of contraception (due to higher age of radical proportion of study proportion). An unreliable method such as Coitus Interrupts (withdrawal method) was used by 29.4% of these patients. In spite of using some type of birth control methods by this studied group, 44% had at least one (and up to seven) occasion of unwanted pregnancy.

When interviewed patients asked about their opinions, 53% believed that, it would be better that,

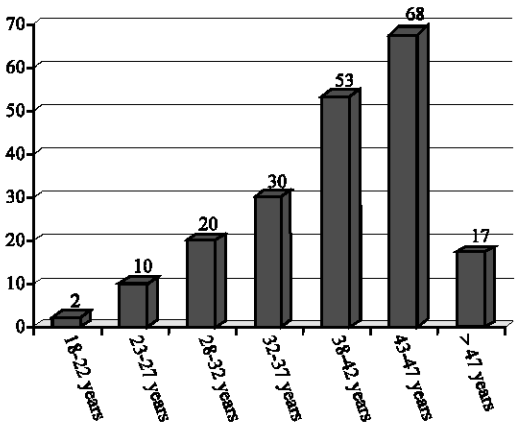

Fig. 1: Age groups of study population

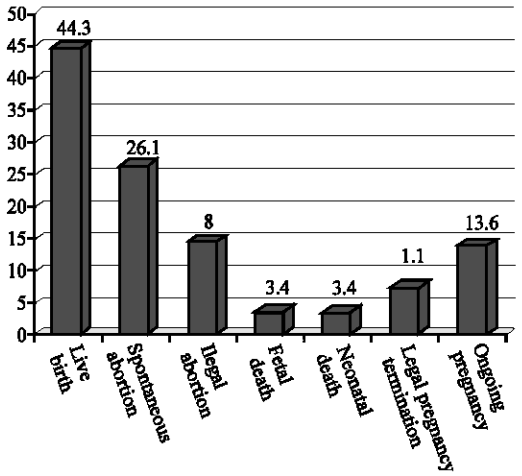

Fig. 2: Outcomes of pregnancies in study population after detection of DM

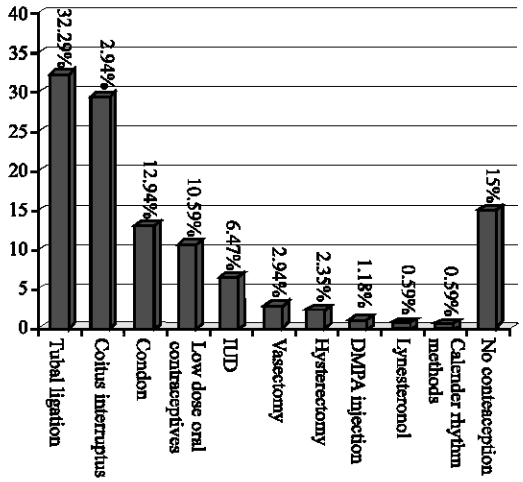

Fig. 3: The frequency of different birth control methods used by diabetics in childbearing years

diabetic women were not conceived, 96% stated that blood sugar control prior to conception, has considerable effect on pregnancy outcome. Sixty three percent admitted that blood sugar control must be monitored carefully during pregnancy. The necessity of changing of care methods during pregnancy was agreed by 83.2%of this group. However, only 37.9% knew that they should use insulin during pregnancy.

Large number of female diabetic patients in childbearing ages (90.5%) were aware of the necessity of prevention of unplanned pregnancies. Huge number of these women (75.5%) confessed that they will terminate pregnancy anyway if unintended pregnancy will be occurred.

DISCUSSION

The prevalence of DM is increasing rapidly and the number of diabetic women in reproductive years is quite high. The number of young women with DM will increase further in accordance with decrease in the age of onset of type 2 DM in most societies (Wild *et al*., 2004). Pregnancy and diabetes have reciprocal effects to each other. It is essential to control diabetes strictly before conception and thought pregnancy. Pregnancy itself in a diabetic woman needs serious care. Unwanted pregnancy in patient with poor metabolic control can encounter him to increased risks of abortion (and their hazards to patient) (Jovanovic *et al*., 2005), aggravation of retinopathy (Star and Carpenter, 1998; Chew *et al*., 1995; Wang *et al*., 1993; Lauritzen*et al*., 1983), nephropathy (Anonymous, 1984; Ekbom *et al*., 2001; Miodovnik *et al*., 1996) and cardiovascular diseases. Incidence of hypertension and preeclampsia in pregnancy associated with diabetes will considerably be high (Sibai *et al*., 2000; Innes *et al*., 2001; Leguizamon *et al*., 2006; Hiilesmaa *et al*., 2000). The already higher risk of infection in a diabetic patient will increase with occurrence of pregnancy (Zhanel *et al*., 1995). On the other hand probability of congenital malformation (Reece *et al*.,1996; Wentzel *et al*., 1999; Wentzel and Eriksson, 1998), spontaneous abortion (Jovanovic *et al*., 2005), macrosomia (Modanlou *et al*., 1982), polyhydramnios (Langer *et al*., 1989), preterm labor (Sibai, 2000) and perinatal motility will threaten fetus. After birth neonate will encounter also with difficulties such as birth trauma due to macrosomia or prematurity, polycytemia, hyperbilirubinemia, hypoglycemia and respiratory problems (Arieh Riskin and Joseph A. Garcia-Prats, 2007) In order to avoid these complications prevention of unintended conceptions has crucial importance in diabetic women, which can be achieved by informing and training of patients as well as widespread availability of contraceptive methods. There was no precise information on contraception status and awareness of these high risk group women in our clinic. We searched in available data bases and did not found a study similar to our study in Iran to compare findings.

However, there are a lot of researches, has been done in abroad, on the positive and negative effects of different contraceptive methods on diabetics and the rate of awareness of these population.

A study by Napoli *et al*. (2005), revealed that 30% of diabetic women used hormonal contraceptives, 12% IUD, 47% natural and/or Barrier Methods and 10% did not use any methods at all. In the study performed by our group, nearly 12% uses hormonal methods, 7% IUD, 30% coitus interrupts, 13% condom, 3% vasectomy and 33% TL.

Rogovskaya *et al*. (2005) studied the effects of progestin-releasing levonorgestrel IUD on blood sugar and didn't found any undesirable effects and it can be used safely in diabetics as contraception.

According to the low percentage of IUD use in our diabetics, we can understand that IUD hasn't a suitable place among in these groups and there is not sufficient information on this contraceptive method (progesterone releasing or simple types). Copper IUD, with no metabolic effects on multiparous women with chronic complications of diabetes is recommended as a safe choice.

About 50% of our patients have had diabetes for 3-10 years of their child-bearing ages which means there is a very high potential for conception during this period if contraceptives is not used strictly. This is the why, the sexual activity of this women are considerable (71.3% said they had intercourse more than 3 times a month).

In our diabetics 28.5% of patients were reported pregnancy history after detection of DM in whom and about half of them had problems (without considering cesarean sections). Compared with pregnancy problems of non-diabetics and their hospital admissions in this period (10.1%) the complication rates in diabetics are considerably high (Karin*et al*., 2005).

Rate of operative deliveries was also high and 64% of women had delivered by cesarean section. This high number is somehow acceptable taking the fact that cesarean is nowadays more commonly recommended by gynecologists to avoid birth trauma in diabetics.

In 35.8% of our population there was a history of over 4 kg deliveries, which highlights insufficient care during pregnancy. Generally the ratio of macrosomia in

infants of diabetic mothers is more than three times in general population (Chauhan *et al*., 2005). Due to this noprefect metabolic control a huge number of infants had postnatal problems (38.5%). This proportion is remarkable compared with problems (including anomalies, low Apgar, low birth weight, hypoxia, breathing problems, intra cranial problems, infections, hypoglycemia, hyperbilirubinemia and...) in non-diabetic mothers infants (15.5%) (Chauhan *et al*., 2005).

Although, 84.5% of interviewed women did not want to conceive in future, 41.5% of them had previous history of unintended pregnancies. Tendency to terminate pregnancy by unusual methods was among 75.5% of them. In spite of lake of interest for conception, 15% of them still do not use any contraceptive methods. The method used by 30% of who use a method is very unreliable (i.e. coitus interrupts).

Rosenthal *et al*. (2004) studied the effects of contraceptive pills in the emergence of diabetes and observed that diabetes frequency does not increase and can be freely used by at risk populations.

One group of researchers in France studied the knowledge of type 1 diabetic women about preconception care. The study covered all women with type 1 diabetes in 11 diabetes centers attending from 1-12 of December 2003. A nameless questionnaire was disposed to these women and their consulting diabetologists. Total 138 women were enrolled in this study. The main reported sources of information about pregnancy were diabetologists (78%) and educational leaflets provided by them (42%). Although 85% of the women declared having received information about preconception care, 48% were unaware of the risk of congenital malformations and 41% were feared for neonatal diabetes however, 82% of the women thought that a level of HbA_1C below 7% was a target to achieve before conception. The study finally revealed that French women with type 1 diabetes, although followed by diabetologists, have major knowledge defects concerning the risks associated with pregnancy (Anonymous, 2005).

And finally, another research explored the awareness of issues related to preconception counseling, reproductive health, contraception, diabetes and pregnancy in adolescent women with diabetes in Pennsylvania of USA, a descriptive-qualitative method which used to collect data during a telephone interview. The responses were written verbatim. Overall, the response "do not know" or "never heard about it" was most frequently given. 65% knew nothing about preconception care. Many weren't aware of the risks of pregnancy-related complications in women with diabetes. Only one fourth were aware of preplanning a pregnancy and the importance of suitable blood sugar control. The results revealed that most of adolescent's female patients did not know about diabetes complications and unplanned pregnancy. Therefore, it is necessary to train them and make them understand this issue and its importance during routine visits (Dennis, 2006).

In the present study, our patients did not have an acceptable level of knowledge about necessity of contraception and preconception cares. About 50% of them think insulin would be harmful during pregnancy and 14.8% believe the use of oral anti-diabetes pills as a safer option during pregnancy, so they should be informed by training to change their mentality.

Blood glucose must be carefully controlled during pregnancy to avoid fetal and maternal complications but still, 37% of our diabetic women do not believe so! 62% of them think methods other than insulin can be used during pregnancy. Ten percent of our diabetic women do not believe in contraception, which can be a very dangerous, considering the increasing number of diabetics in our society.

The above statistics are considerable and indicate the need for expanded education and cultural training in this field.

CONCLUSION

In conclusion, diabetic women spent a large part of their lives in the years with potentials for conception. Unwanted pregnancy in diabetes is common. A large number of pregnancies in diabetics associated with serious fetal and maternal perinatal complications. Although most of diabetic women don't want to be pregnant in future, many of them do not use any contraceptive methods. Coitus interrupts after TL is the most common used method, while a safe and effective method like IUD is only used by a small percentage. The level of knowledge of diabetic women of child-bearing ages about the contraceptive methods and necessity of using these methods are low. Many of them knew a little about blood sugar control measures during pregnancy.

REFERENCES

Anonymous, 1984. Blood glucose control and the evolution of diabetic retinopathy and albuminuria. A preliminary multicenter trial. The Kroc Collaborative Study Group. N. Engl. J. Med., 311: 365.

Arieh Riskin and Joseph A Garcia-Prats, 2007. Infant of a diabetic mother. Up to Date, 15: 1.

Chauhan, S.P., W.A. Grobman and R.A. Gherman *et al*., 2005. Suspicion and treatment of the macrosomic fetus: A review. Am. J. Obstet Gynecol. 193: 332.

Chew, E.Y., J.L. Mills and B.E. Metzger *et al*., 1995. Metabolic control and progression of retinopathy: The Diabetes in Early Pregnancy Study. Diabetes Care, 18: 631.

Dennis, Ch.P., 2006. American Association of Diabetes Educators, Reproductive Health and preconception counselling. Awareness in Adolescents with Diabetes, Pittsburg, Pensylvania, 32: 235-242.

Diabetes and Pregnancy Group, 2005. Knowledge about preconception care in French women with type 1 diabetes. Diabetes Metab. 31(5): 443-447.

Diabetes Atlas, 2006. 3rd Edn. © International Diabetes Federation.

Ekbom, P., P. Damm and B. Feldt-Rasmussen *et al*., 2001. Pregnancy outcome in type 1 diabetic women with microalbuminuria. Diabetes Care, 24: 1739.

Esteghamati, A., M.M. Gouya, M. Abbasi, A. Delavari, S. Alikhani, F. Alaedini, A. Safaie, M. Forouzanfar and E.W. Gregg, 2007. Prevalence of Diabetes Mellitus and Impaired Fasting Glucose in the Adult Population of Iran: The National Survey of Risk Factors for Non-Communicable Diseases of Iran. Diabetes Care (Epub ahead of print).

Hiilesmaa, V., L. Suhonen and K. Teramo, 2000. Glycaemic control is associated with pre-eclampsia but not with pregnancy-induced hypertension in women with type 1 diabetes mellitus. Diabetologia, 43: 1534.

Innes, K.E., J.H. Wimsatt and R. McDuffie, 2001. Relative glucose tolerance and subsequent development of hypertension in pregnancy. Obs. Gynecol., 97: 905.

Jovanovic, L., R.H. Knopp and H. Kim *et al*., 2005. Elevated pregnancy losses at high and low extremes of maternal glucose in early normal and diabetic pregnancy: Evidence for a protective adaptation in diabetes. Diabetes Care, 28: 1113.

Karin, G. *et al*., 2005. Birth cent er care, over a 10 period: Infant morbidity during the first month after birth. Acta Pediatrica. 94: 1253-1260.

Langer, O., J. Levy and L. Brustman *et al*., 1989. Glycemic control in gestational diabetes mellitus-how tight is tight enough: Small for gestational age versus large for gestational age?. Am. J. Obs. Gynecol., 161: 646.

Lauritzen, T., K. Frost-Larsen and H.W. Larsen *et al*., 1983. Effect of 1 year of near normal blood glucose levels on retinopathy in insulin-dependent diabetics. Lancet, 1: 200.

Leguizamon, G.F., N.P. Zeff and A. Fernandez, 2006. Hypertension and the pregnancy complicated by diabetes. Curr. Diab. Rep., 6: 297.

Miodovnik, M., B.M. Rosenn and J.C. Khoury *et al*., 1996. Does pregnancy increase the risk for development and progression of diabetic nephropathy? Am. J. Obstet. Gynecol. 174: 1180.

Modanlou, H.D., G. Komatsu and W. Dorchester *et al*., 1982. Large- or-gestational-age neonates: Anthropometric reasons for shoulder dystocia. Obs. Gynecol., 60: 417.

Napoli, A. *et al*., 2005. Contraception in diabetic women, An Italian study. Diabetes Res. Clin. Pract., 67 (3): 267-72 .

Reece, E.A., A. Wiznitzer and C.J. Homko *et al*., 1996. Synchronization of the factors critical for diabetic teratogenesis: An in vitro model. Am. J. Obs. Gynecol., 174: 1284.

Rogovskaya, S. *et al*., 2005. Effect of Levonorgestrel intrauterine system on women with type 1 Diabetes: A randomized trial. Obested-Gynecol., 105 (4): 811-815.

Rosemary Temple, Vivien Aldridge, Richard Green wood, Philip Heyburn, Michael Sampson and Katharine Stanley, 2002. Association between outcome of pregnancy and glycaemic control in early pregnancy in type 1 diabetes: Population based study. BMJ., 3 25 (7375): 1275-6.

Rosental, A.D. *et al*., 2004. Oral contraceptive use and risk of Diabetes among Chinese Women. Contraception, 69 (3): 251-7.

Sibai, B.M., S. Caritis and J. Hauth *et al*., 2000. Risks of preeclampsia and adverse neonatal outcomes among women with pregestational diabetes mellitus. National Institute of Child Health and Human Development Network of Maternal-Fetal Medicine Units. Am. J. Obstet. Gynecol., 182: 364.

Sibai, B.M., S.N. Caritis and J.C. Hauth *et al*., 2000. Preterm delivery in women with pregestational diabetes mellitus or chronic hypertension relative to women with uncomplicated pregnancies. The National institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Am. J. Obstet. Gynecol., 183: 1520.

Star, J. and M.W. Carpenter, 1998. The effect of pregnancy on the natural history of diabetic retinopathy and nephropathy. Clin. Perinatol., 25: 887.

Total Prevalence of Diabetes and Pre-diabetes. http//www.diabetes.org/diabetes-statistics/prevalence.jsp.

Wild, S., G. Roglic and A. Green *et al*., 2004. Global prevalency of diabetes: Estimates for the year 2000 and projections for 2030. Diabetes Care, 27: 1047.

Wang, P.H., J. Lau and T.C. Chalmers, 1993. Meta-analysis of effects of intensive blood glucose control on later complications of type 1 diabetes. Lancet. 341: 1306.

Wentzel, P. and U.J. Eriksson, 1998. Antioxidants diminish developmental damage induced by high glucose and cyclooxygenase inhibitors in rat embryos in vitro. Diabetes, 47: 677.

Wentzel, P., N. Welsh and U.J. Eriksson, 1999. Developmental damage, increased lipid peroxidation, diminished cyclooxygenase-2 gene expression and lowered prostaglandin E2 levels in rat embryos exposed to a diabetic environment. Diabetes, 48: 813.

Zhanel, G.G., L.E. Nicolle and G.K.M. Harding *et al*., 1995. Prevalence of asymptomatic bacteriuria and associated host factors in women with diabetes mellitus. Clin. Infect. Dis., 21: 316.