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孕期个性化营养干预对妊娠期糖尿病孕妇糖脂水平及妊娠结局的影响*

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摘要 目的:探讨孕期个性化营养干预对妊娠期糖尿病孕妇糖脂水平及妊娠结局的影响。**方法:**选择2016年8月-2017年10月期间于我院产检的妊娠期糖尿病孕妇160例,以随机数字表法分为研究组(n=80)和对照组(n=80)。对照组给予常规营养干预,研究组则予以孕期个性化营养干预。比较两组干预前后空腹血糖、餐后2h血糖、总胆固醇(TC)、三酰甘油(TG)、高密低脂蛋白胆固醇(HDL-C)、低密度脂蛋白胆固醇(LDL-C)水平,观察孕妇及新生儿并发症发生情况。**结果:**干预后两组孕妇空腹血糖、餐后2 h血糖显著降低,且研究组低于对照组(P<0.05)。干预后对照组孕妇TC、TG、LDL-C较干预前显著升高(P<0.05),HDL-C差异无统计学意义(P>0.05),研究组血脂水平与干预前比较差异无统计学意义(P>0.05),与对照组比较,研究组孕妇TC、TG、LDL-C水平更低(P<0.05)。研究组妊娠期高血压、胎膜早破发生率均明显低于对照组(P<0.05),两组感染、产后出血发生率比较无统计学差异(P>0.05)。与对照组比较,研究组新生儿窘迫、巨大儿、新生儿低血糖、早产儿的发生率降低(P<0.05)。**结论:**孕期个性化营养干预可有效改善妊娠期糖尿病孕妇的糖脂水平,且能够有效降低并发症发生率,从而改善妊娠结局。

关键词:妊娠期糖尿病;个性化营养干预;血糖;血脂;妊娠结局

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Effect of Individualized Nutrition Intervention During Pregnancy on Glycolipid Level and Pregnancy Outcome in Pregnant Women with Gestational Diabetes*

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ABSTRACT Objective: To investigate the effect of individualized nutrition intervention during pregnancy on glycolipid level and pregnancy outcome in pregnant women with gestational diabetes. **Methods:** 160 pregnant women with gestational diabetes in our hospital from August 2016 to October 2017 were selected, they were divided into the study group (n=80) and the control group (n=80) by the random digital table method. The control group was given routine nutrition intervention, and the study group was given individual nutrition intervention during pregnancy. The fasting blood glucose, postprandial 2 h blood glucose, total cholesterol (TC), three triglyceride (TG), high-density low-fat cholesterol (HDL-C) and low density lipoprotein cholesterol (LDL-C) were compared between the two groups before and after intervention, the complications of pregnant women and newborns were observed. **Results:** The fasting blood glucose and postprandial 2 h blood sugar decreased significantly in the two groups after intervention, and the study group was lower than that of the control group (P<0.05). The TC, TG and LDL-C of the control group after intervention were significantly higher than before intervention (P<0.05), there was no significant difference in HDL-C (P>0.05), there was no significant difference between the lipid levels in the study group before intervention (P>0.05). Compared with the control group, the TC, TG and LDL-C of the study group were significantly lower (P<0.05). The incidences of hypertension and premature rupture of fetal membranes in the study group were significantly lower than those of the control group(P<0.05). There was no significant difference in the incidence of infection and postpartum hemorrhage between the two groups (P>0.05). Compared with the control group, the incidence of neonatal distress, macrosomia, neonatal hypoglycemia, premature infants in the study group were significantly lower (P<0.05). **Conclusion:** Individualized nutrition intervention during pregnancy can effectively improve the glycolipid level of pregnant women with gestational diabetes, and effectively reduce the incidence of complications and improve the pregnancy outcome.

Key words: Gestational diabetes; Individualized nutrition intervention; Blood glucose; Blood lipid; Pregnancy outcome

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前言

妊娠期糖尿病是指妊娠期间发生的糖尿量异常、血糖异常以及糖尿病的总称,是妊娠期常见疾病[1-3]。近年来随着人们生

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活水平的不断改善以及饮食结构的改变,我国妊娠期糖尿病发病率不断上升[4,5]。有报道显示,目前我国妊娠期糖尿病发病率为 1%-14%,因糖尿病引发的流产率可达 15%-30%,并且妊娠期糖尿病不仅会引发一系列严重的近期或远期并发症,还会对母婴生命健康安全造成严重影响[6-8]。妊娠期糖尿病发病原因复杂,一般认为该病有一定遗传倾向,同时主要与妊娠期间的营养摄入不均衡以及营养过剩有关[9-11]。因此,根据孕妇身体情况制定个体化的营养干预,加强孕前、孕期的营养管理显得尤为重要。本研究通过孕期个性化营养干预对妊娠期糖尿病孕妇糖脂水平及妊娠结局的影响进行观察分析,旨在为临床妊娠期糖尿病孕妇营养干预方案的选择提供参考,以达到改善妊娠结局的目的,现作如下报道。

1 资料与方法

1.1 一般资料

选取我院于 2016 年 8 月 -2017 年 10 月期间收治的 160 例妊娠期糖尿病孕妇为研究对象。纳入标准:(1)所有孕妇均符合妊娠期糖尿病诊断标准[12];(2)年龄在 20～38 岁之间;(3)均为单胎妊娠;(4)临床病历资料完整。排除标准:(1)合并心、肝、肾等脏器功能严重障碍者;(2)既往有吸烟、饮酒以及长期服药史者;(3) 血清肌酐水平≥ 150 μmol/L 或转氨酶超过正常上限 2.5 倍以上;(4)近期有急慢性感染或放射线接触史者;(5)存在甲状腺功能亢进症或神经系统疾病者。将研究对象以随机数字表法分为研究组和对照组。研究组 80 例,年龄 20～37 岁,平均(27.52± 5.32)岁;孕周 28～39 周,平均(35.20± 2.25)周;初产妇 56 例,经产妇 24 例。对照组 80 例,年龄 22～38 岁,平均(26.84± 5.35)岁;孕周 28～38 周,平均(34.67± 2.21)周;初产妇 52 例,经产妇 28 例。两组年龄、孕周、产次等情况比较无统计学差异(P>0.05),组间存在可比性。两组孕妇均签署了知情同意书,我院伦理委员会已批准。

1.2 诊断标准

于妊娠 24～28 周予以口服 75 g 葡萄糖耐量试验,其中满足以下任何一点即可判断为妊娠期糖尿病:(1)空腹血糖≥ 5.1 mmol/L;(2)餐后 1 h 血糖≥ 10.0 mmol/L;(3)餐后 2 h 血糖≥ 8.5 mmol/L[4]。

1.3 研究方法

对照组予以常规营养干预,主要包括产前常规检查,健康教育指导以及妊娠相关知识讲座等。研究组则予以孕期个性化营养干预,具体方式如下:(1)建立营养干预小组:主要由产科医生、主管护师、专科护士与营养师各 1 名组成。小组成员均接受妊娠期糖尿病孕妇营养知识培训,并在考核成功后参与本次研究。(2)营养情况评估:分别于孕 28 周开始,定期 4 周进行一次营养情况评估,计算孕妇标准体质量,明确其每日能量系数与日需总能力。同时,帮助孕妇合理搭配脂肪、蛋白质、碳水化合物、矿物质与膳食纤维供给比例,保证每日摄入的脂肪量为 50～70 g,蛋白质量 80～100 g,碳水化合物量 200～300 g[13]。(3)膳食指导:采用实物交换法与食物模型法指导孕妇合理摄入蔬菜、大豆、水谷以及谷薯等 8 类食物,每份食物热量保持在 376 KJ 左右,以少食多餐为原则。(4)制定个性化饮食方案:按照孕妇的个体差异,制定个性化饮食方案,合理安排三餐,主要摄入薯类、燕麦与荞麦等含糖量较低的膳食纤维食物;蛋白质类食物主要以豆制品、海鲜以及奶等为主;蔬菜类食物主要以绿色蔬菜与黄色蔬菜为主。同时,注意在烹饪时尽量选用脂肪酸含量较低的油。

1.4 观察指标

分别比较两组干预前后空腹血糖、餐后 2 h 血糖及血脂水平,记录孕妇及新生儿并发症发生情况,其中空腹血糖、餐后 2 h 血糖应用罗氏血糖检测仪检测。应用日立 5300 全自动生化检测仪检测低密度脂蛋白胆固醇(low density lipoprotein cholesterol,LDL-C)、总胆固醇(total cholesterol,TC)、高密度脂蛋白胆固醇(high density lipoprotein cholesterol,HDL-C)、三酰甘油(triacylglycerol,TG)水平。孕妇并发症包括妊娠期高血压、感染、产后出血以及胎膜早破等。观察新生儿低血糖、新生儿窘迫、早产儿、巨大儿等新生儿并发症发生情况。

1.5 统计学方法

采用 SPSS25.0 进行统计分析,感染、产后出血发生率等计数资料以率(%)表示,实施 x^2 检验,餐后 2 h 血糖、TG、LDL-C 水平等计量资料以($\bar{x}\pm s$)表示,实施 t 检验,将α=0.05 设为检验水准。

2 结果

2.1 干预前后两组血糖水平对比

干预前两组孕妇餐后 2h 血糖、空腹血糖比较无统计学差异(P>0.05)。干预后,两组孕妇血糖水平下降,且与对照组比较,研究组血糖水平更低(P<0.05)。见表 1。

表 1 干预前后两组血糖水平对比($\bar{x}\pm s$)

Table 1 Comparison of blood glucose levels before and after intervention between the two groups($\bar{x}\pm s$)

Groups	n	Fasting blood glucose(mmol/L)		Postprandial 2h blood glucose(mmol/L)	
		Before intervention	After intervention	Before intervention	After intervention
Study group	80	6.87± 1.19	5.22± 1.03[a]	9.87± 1.49	7.01± 1.32[a]
Control group	80	6.90± 1.07	5.94± 1.20[a]	9.82± 1.48	7.87± 1.43[a]
t	-	0.168	4.072	0.213	3.953
P	-	0.867	0.000	0.832	0.000

Note: Compared with before intervention, [a]P<0.05.

2.2 干预前后两组血脂水平对比

干预前两组孕妇 TC、TG、LDL-C、HDL-C 水平比较无统计学差异(P>0.05),干预后对照组孕妇 TC、TG、LDL-C 水平较干预前显著升高 (P<0.05),HDL-C 水平比较差异无统计学意义(P>0.05),研究组 TC、TG、LDL-C、HDL-C 水平与干预前比较差异无统计学意义(P>0.05),与对照组比较,研究组孕妇干预后 TC、TG、LDL-C 水平更低(P<0.05)。见表 2。

表 2 干预前后两组血脂水平对比($\bar{x}\pm s$)

Table 2 Comparison of blood lipid levels before and after intervention between the two groups($\bar{x}\pm s$)

Groups	Time	TC(mmol/L)	TG(mmol/L)	HDL-C(mmol/L)	LDL-C(mmol/L)
Study group(n=80)	Before intervention	6.04± 1.04	2.85± 1.23	1.83± 0.38	3.15± 0.88
	After intervention	5.98± 1.05[b]	2.90± 1.33[b]	1.79± 0.30	3.18± 0.71[b]
Control group(n=80)	Before intervention	6.02± 1.05	2.86± 1.25	1.84± 0.38	3.16± 0.90
	After intervention	6.63± 1.03[a]	3.99± 1.38[a]	1.81± 0.35	4.01± 0.92[a]

Note: Compared with before intervention, [a]P<0.05; Compared with control group, [b]P<0.05.

2.3 两组孕妇并发症发生情况对比

研究组胎膜早破、妊娠期高血压发生率均低于对照组(P<0.05),两组产后出血、感染的发生率比较无统计学差异(P>0.05)。见表 3。

表 3 两组孕妇并发症发生情况对比[例(%)]

Table 3 Comparison of the incidence of complications between the two groups[n(%)]

Groups	n	Pregnancy induced hypertension	Infected	Postpartum hemorrhage	Premature rupture of membranes
Study group	80	3(3.75)	2(2.50)	2(2.50)	2(2.50)
Control group	80	11(13.75)	4(5.00)	3(3.75)	9(11.25)
x^2	-	5.010	0.693	0.206	4.783
P	-	0.025	0.405	0.650	0.029

2.4 两组新生儿并发症发生情况对比

研究组早产儿、巨大儿、新生儿窘迫、新生儿低血糖的发生率均低于对照组(P<0.05)。见表 4。

表 4 两组新生儿并发症发生情况对比[例(%)]

Table 4 Comparison of the incidence of neonatal complications between the two groups[n(%)]

Groups	n	Premature infant	Macrosomia	Neonatal distress	Neonatal hypoglycemia
Study group	80	6(7.50)	5(6.25)	3(3.75)	3(3.75)
Control group	80	15(18.75)	17(21.25)	10(12.50)	12(15.00)
x^2		4.440	7.589	4.103	5.959
P		0.035	0.006	0.043	0.015

3 讨论

妊娠期糖尿病属于妊娠期妇女多发疾病之一,主要是指孕妇妊娠后,发现有各种程度的糖耐量减低或明显的糖尿病[14-16]。近年来,随着人们饮食习惯、生活方式、生活压力的变化,妊娠期糖尿病的发病率逐渐升高,并且妊娠期糖尿病孕妇死亡率高达 27%～30%,胎儿围产期死亡率甚至在 40%以上[17-19]。随着胰岛素的应用以及围产医学的逐渐进展,胎儿围产期死亡率已有一定程度的下降, 但当今妊娠期糖尿病的发病率却依旧较高,母婴不良妊娠结局无法完全避免[20,21]。妊娠期糖尿病是一种代谢性疾病,除与妊娠期孕妇激素分泌改变以外,与生活方式、饮食习惯也有密切关系[22]。研究表明,通过调整孕妇的营养摄入和增加运动量可以使超过 2/3 的妊娠期糖尿病孕妇血糖恢复正常水平[23,24]。

本研究通过对我院产检的妊娠期糖尿病孕妇 160 例对照研究发现,干预后两组孕妇空腹血糖、餐后 2 h 血糖显著降低,且研究组低于对照组,这与 Afandi BO 等人[25]的研究报道相一致,表明了孕期个性化营养干预可有效改善孕妇血糖水平。分析原因,可能是研究组干预方式通过专业的营养师参与,根据孕妇的个体差异予以针对性的营养干预措施, 制定了科学、合理的饮食方案,并严格限制孕妇三大营养物质的摄入量,从而有效控制孕妇血糖水平。而干预后对照组孕妇 TC、TG、LDL-C 较干预前显著升高。李文蕾等[26]研究显示妊娠期糖尿病孕妇因糖代谢异常,孕中晚期 TC、TG、LDL-C 会显著升高,这与本研

究结果基本一致。而经过个体化营养干预,研究组血脂水平与干预前比较无明显变化,与对照组比较,研究组孕妇 TC、TG、LDL-C 水平更低,这说明了孕期个性化营养干预可显著改善孕妇血脂水平。其中主要原因可能在于孕期个性化营养干预可弥补常规营养干预中孕妇及其家属对妊娠期饮食认知误区较多、饮食方案存在一定的随机性、不确定因素较多等局限性。通过专业的营养学家予以指导搭配,并根据孕妇个体差异进行个性化干预,有利于为孕妇调整最佳的饮食方案及习惯,从而达到改善孕妇血脂水平的目的[27,28]。另外,研究组妊娠期高血压、胎膜早破发生率均低于对照组,与此同时,研究组早产儿、巨大儿、新生儿窘迫、新生儿低血糖发生率均低于对照组,这提示了孕期个性化营养干预可有效降低不良妊娠结局的发生风险。究其原因,笔者认为可能是孕期个性化营养干预为孕妇以及胎儿提供足够的营养,且不会对胎儿的生长发育产生影响,保证孕妇孕期体重增长维持在 10.2 kg～12.5 kg, 从而有效降低围生产期母婴并发症的发生率,从而获得良好的妊娠结局[29,30]。

综上所述,根据孕妇个体差异进行个性化干预,有利于调整孕妇的饮食方案及习惯,从而达到改善孕妇血糖、血脂水平的目的,同时有利于降低不良妊娠结局的发生风险。

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信息学软件的预测结果具有一定可靠性,能够为对 hsa-miR-126 的进一步研究提供指导方向。

综上所述,hsa-miR-126 通过调控靶基因在多种肿瘤和其他疾病的发生发展中发挥生物学功能,可能可以作为新的分子标志物和新的治疗靶点，对于一些肿瘤的分型具有指导作用。使用各种生物信息学软件对 hsa-miR-126 靶基因进行预测和功能分析能够为对 hsa-miR-126 的进一步研究提供指导方向。

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