EFFECTIVENESS OF PROBIOTIC SUPPLEMENT TO GLUCOSE BLOOD LEVEL TOWARD GESTASTIONAL DIABETES MELITUS

Elly Dwi Masita
Professional in Universitas Nahdlatul Ulama Surabaya
Email: ellydm@unusa.ac.id

ABSTRACT
Introduction :Gestastional the prevalence of diabetes mellitus in Indonesia reached 1.9%-3.6% in the entire of pregnancy and has increased every year. Gestasional of diabetes mellitus risks of preeclampsia, abortion, polyhidramnion, infections, uterine contractions disorder, partus long, operation caesar risk, post delivery bleeding and occurs diabetes mellitus sequel. In infants occur makrosomia, hypoglycemia in the first 24 hours of birth, congenital defects, hypokalsium, hyperbilirubin, coroner and kidney disorders, neuro and skelet disorders, this condition increasing the death rate of mothers and babies. This study aim to invesgate to know the different blood glucose level before and after given probiotic supplementation for 7 days every day on gestasional diabetes. **Method :** This study was quasy experiment with pre – post test control. The population includes all of gestastional diabetus mellitus of 81 subject. Sampling used a purposive sampling and sample was 36 subjek and use pair t test analisis. The characteristic of subject this studi are gestastional diabetes mellitus on trimester II dan III with primigaravida or multigravida, without complication of diabetes melitus, normal pregnancy and has got programming of diabetes pregnancy. Result of paired t test is $p < 0.05$. **Result :** Results is there are influence supplement probiotic giving to blood glucose level with t test prandial blood glucose level $p = 0.001$, 2 hours post prandial blood glucose level $p = 0.001$. **Discussion :** Probiotic supplement proven to be an influence blood glucose level to gestastional diabetus

Key words: Probiotic, Blood Glucose Level, Gestastional Diabetus

INTRODUCTION

Gestastional diabetes melitus in Indonesia have a prevalence of 1.9%-3.6% with overall of pregnancy. In Surabaya has increasing every year. In 2013 there is pregnancy with diabetics 71 and in 2014 increasing to 86 (Health Office, 2014)

Complication accurs of pregnancy, childbirth, post partum soincreasing mother child death rate. Risks of mother arepreeclampsia, abortion, polyhidramnion, infection, contraction uterine disorder, long first delivery periode, risky of caesarean, infection and bleeding post partum and diabetes mellitus sequel. Infants by 5/10,000 of births are makrosomia, hypoglycemia, congenital defects , defect of birth, abnormalities of heart, kidneys, neuro and skelet, hypokalsium, hyperbilirubun, asphyxia syndrome and breath failure. Cause of is insulin produced insufficient by the body not enough so metabolism of glucose through cell membrane had disturbed with trigged by hormonal placenta lactogen, diet, heredity, stress, smoking, obesity, excessive carbohidarat consumtion, chemicals or medicines and pancreatic cell damage by viral , bacterial infections (Syaifudin cited by Sukarya, 2008). Symptom and signsare polyuria, polydipsia, dizziness, obesity, nausea and vomiting, obesity, high-fundus uteri is greater than gestational age, weak body, tingling, itching, haze, pruritus vulva, ketonemia, glikosuria, blood glucose 2 hours post prandial > 200 mg/dl , blood glucose prandial > 126 mg/dl (Syaifudin cited by Sukarya, 2008).

Hariadi Cited by Juwono (2005) menagement includes screening, managing patern, administering insulin and specific antenatal care. Screening can be done with indication of obesity, having diabetes mellitus history on, have a history of urine glucose intolerance, and having family history of type 2 diabetes mellitus . If risks of factors are found do TTGO test and had reviewed test in

24-28 weeks and maintain prandial blood glucosalevel < 105 mg/dl and blood glucose post prandial< 120 mg/dl (Juwono, 2005; Sukarya, 2008).

Management had not done maximum yet, especially of patterns food so has increasing every year and still to find abnormal blood glucose control. Unsuccessfully is caused by less knowledge level and disobey with concerning recommended pattern

Probiotic is living microbes actively improving health of consumers by balancing digestive tract microflora if taken on living conditions with sufficient able to regulate immune responses fragment potentially antigenic food, removes bacterial pathogen adhesion, replace with bacteria non pathogen ,modify genetic strain of bacteria to produce antibodies, enzymes and cytokines (Zhang, Y *et al*, 2013; Osta'dhrahimi*et al*, 2000, Firouzi *et al*, 2015). Probiotic safe for pregnancy and lactation, improve lipid profile, glucose tolerance, insulin secretion, decreas plasma cytokines proinflamation(Loegircio *et al*, 2005; Shavaki *et al*, 2013).

A preliminary study at November 2015 showing that 10gestastinaldiabetes haddecreased blood glucose 1-2 mg/dl after had given probiotic supplement drink for 7 days. Research of probiotic with human subject is Loegircio *et al* (2005) probiotic can to manipulate intestinal flora, increase cytokine pro inflammatory and hepatoprotector so beneficial for chronic liver disease. In line with research above is Aller *et al* (2011), probiotics improve levels of ALT, AST, GT- [3] and research of Dong, *et al* (2013) probiotic lactobaccilus casei shirota significant increases activity of NK cells and antibodies

RESEARCH METHOD

Design of research has experiments with pre and post control. The population of 81 subject with gestastional diabetes mellitus and sample consist of all gestastional diabetes in Surabaya. The sampling using purposive sampling with a total sample of 36 sample control and treatment groups 36 sample.This study has two variables. The variable are supplement probiotic as dependent variable and blood glucose level as independent variabels. This study to be done since oktober 2015 until desember 2015 at local government clinic. Blood glucose level had taken by digital equipment trough artery blood fingertip. The first process of ethical clearence is managing recommendation from center of health government, at second meet subject and explain about a purpose of study as well as safety probiotic supplement for pregnancy and infant and third to give agreement receipt and advise to signature informed concent as agreement of evidancedStatistical tests using paired t test (Dahlan, 2014)

RESULT

Table 1.1 Frequency distribution

Group mg/dl	N	Min	Maks
BGL pre	36	127	142
BGL post		110	120
BGL 2 PP pre		160	170
BGL 2 PP post		119	120
Paritas			
Trimester II	18		
Trimester III	18		

Source : 2015

Table 1.1 describe that prandial blood glucose level before given probiotic supplement of minimum level is 127 mg/dl and maksimum level of 142 mg/dl and after given probiotic supplement of minimum level is 110 while maksimum level of 120 mg/dl. While 2 hour post prandial blood glucose level before suplent of minimum level is 160 mg/dl and maksimum level of 170 mg/dl, but after supplement of minimum level is 119 mg/dl and maksimum level is 120 mg/dl. The paritas are trimester II of 50 % and trimester III of 50%

Table 2.1 Normality result test with Kolmogorov Smirnov

Group	p > 0.05
Pair BGL prandial pre – post suplement	0.383
Pair BGL 2 hour post prandial pre –post suplement	0.083

Source : 2015

Tabel 2.1 has explaining normality test with kolmogorov smirnov test and significant of blood glucose prandial p = 0.383 (p> 0.05) it means the distribution is normal as wel as with 2 hour post prandial test on signifikansi p= 0.083 (p> 0.05) that means distribution is normal.

Table 3.1 Paired statistic test

	Pair group mg/dl	Mean	N	Std. Dev	Std. Error Mean
Pair 1	BGL pre	137	36	3.461	.577
	BGL post	112	36	3.692	.615
Pair 2	BGL2jampre	166	36	2.620	.437
	BGL2jampost	120	36	.351	.058

Source : 2015

Table 3.1 describe that mean before supplement of 137 mg/dl for prandial blood glucose level and after supplement of 112 mg/dl. This condition indicates that there is a decrease in the levels of prandial blood glucose by 25 points,

While 2 hour post prandial blood glucose level before supplement of 166 mg/dl and after supplement of 120 mg/dl. This condition indicates that there is a decrease in the levels of 2 hour prandial blood glucose by 46 points

Table 4.1 Paired t test correlation

Group mg/dl		N	Correlation	p
Pair 1	BGLpre&GDLpost	36	.467	.004
Pair 2	BGL2jam pp pre & BGL2jampp post	36	-.056	.745

Source : 2015

Table 4.1 explain that r squared of prandial blood glucose level of 0.467^2 (0.21) and significant with p =0.004. That means probiotic supplement 1 table spoon every day which mixed 250 cc drinking water can to impact prandial blood glucose level in constant of 21% while 79% had affected by other factors. But in 2 hour post prandial blood glucose level of -0.056^2 (0.003) with sigifikansi p = 0.745 that means probiotic supplement has no effect in significant 2 hour blood glucose post prandial level of 0.03% while 99 % had affected other factors. This condition indicates that there is a change in the levels of glucose 2 hour post prandial but not consistent. Most had turned lower and most had not changed

Table 5.1 Paired sample t test

Group	Paired Differences				t	df	p
mg/dl	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper		
Pair 1 BGL pre - BGL Lpost	24.75	3.69	.61	23.49	26.	40.15	35	.001
Pair 2 BGL 2 jam pre- BGL 2jam post	45.77	2.66	.44	44.87	47	103.13	35	.001

Tabel 5.1 explain paired t test results obtained p = 0.001 that means 1 tablespoon probiotic supplement mixed with 250 cc of drinking water for 7 days every day impact on blood glucose levels in pregnancy with diabetes mellitus (Sakai *et al*, 2011; Glesson *et al*, 2015). The means of prandial blood glucose level before and after supplement of 25 mg/ dl (M= 24.75 ; SD = 3.69) and 46 mg/dl for blood glucose level 2 hour post prandial (M=45.77; SD = 2.66)

DISCUSSION

Paired t test results is $p < 0.05$ that means that prandial blood glucose levels experience a change of 3 mg/dl and 2 hour of post prandial blood glucose of 3 mg/dl after a given probiotic supplements. This condition cause of ability of probiotic to manipulate mikrota intestinal flora.The equilibrium of intestinal flora can to secrete cytokines and to increase hepatoprotectorso being toreduce fat perioksidasi and able to improve the layer cells damaged by free radicals. In addition, to probiotics are able to fix β cells of pancreas damaged so stabilizing of insulin metabolism and improve blood glucose (Loegircio, 2005; Takeda, 2007; Dong, 2013)

CONCLUSION AND RECOMMENDATION

There is on influence of probiotic supplements concerning blood glucose levels towardgestational diabetes mellitus is $p < 0.05$ (p=0.001) so given probiotic supplement had recommended for gestational diabetes mellitus as blood glucose balanced and supplement probiotic given need to be accompanied by the expert

ACKNOWLEDGEMENT

This study has been supported by biojannah and bioterra company which probiotic product, Central Java. Indonesia.The author are greetfull to gestastional diabetes mellitus suffers as kind colaboration and overall helping in making this study posible

REFERENCES

Aller R, De Luis DA, Izaola O, Conde R, Gonzales Sagrado M, Primo D, et al.2011. Effect Of A Probiotic On Liver Aminotransferases In Nonalcoholic Fatty Liver Disease Patients: A Double Blind Randomized Clinical Trial. Eur*rev Med Pharmacolsci*ence;15(9):1090-1095.

Dahlan, S. 2014. *Besar Sample Dan Cara Pengambilan Sample Dalam Penelitian Kedokteran Dan Kesehatan*. Jakarta. Salemba Medika P 117

Dong, H., Ian , R., Linda, V., Thomas Parveen Yakub. 2013. Immunomodulatory Effects Of A Probiotic Drink Containing Lactobacillus Casei Shirota In Healthy Older Volunteers. *Europe Nutrition Journal.*52(8):1853 63.doi:10.1007/s00394-012-0487

Health Service Of City on Surabaya. 2014. *The report of the Ministry of public health. Pregnancy Diabetus*. Surabaya. Health Office Surabaya

Firouzi, S, Mochmad. Yosuf, BN., Majid. HA., Ismail, A., Kamarudin, NA. 2015. Effect Of Microbial Cel Preparation On Renal Profile And Liver Function Among Type 2 Diabetics. *Journal Med* (5).433.Doi.101186/S129.06-015-0952-5

Gleeson M, Bishop NC, Oliveira M, Tauler P (2011) Daily Probiotic's (Lactobacillus Casei Shirota) Reduction Of Infection Incidence In Athletes. Int *J Sport Nutr Exerc Metab* 21(1):55–64

Juwono, HI. 2005. *Diabetus Melitus Gestastional. Dalam Hariadi. Ilmu Kedokteran Fetomaternal*. Surabaya: Himpunan Kedoktean Fetomaternal Perkumpulan Obstetry Dan Gynecology. H 564-570

Loguercio C, Federico A, Tuccillo C, Terracciano F, D'Auria MV, De Simone C, et al. Beneficial. 2005

Osta'dhrahimi, A,.Taghizadeh A., Mobaserri., M. Fahrun N., et al. 2015. Effect Probiotic Fermented Milk On Glucemic Control And Lipid Profil In Type 2 Diabetic Patient. Iran. *Public Health Journal.*44(2):228-237

Sukarya, WS. 2008. *Kehamilan Dengan Gangguan reproduksi. Dalam syaifudin, AB,.Ilmu kebidanan* edisi ketiga : Jakarta. PT . Bina Pustaka

Takeda K, Okumura K (2007) Effects Of A Fermented Milk Drink Containinglacto bacillus Caseistrain Shirota On The Human NK cell Activity. *J Nutr* 137(3):791S–793S 28.

Zhang Y, Zhang H. 2013. Microbiota Associated With Type 2 Diabetus melitus And It Is Releate Complication. Food Science And Human Wellness. P 167-72