International Journal of ChemTech Research
CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.10 No.9, pp 876-880, 2017

Relation between Body Mass Index with Triglyceride Levels At Coronary Heart Disease (CHD) At RSUP Haji Adam Malik Medan

***[1]Rusdiana, [2]Anitya Mareta**

[1]Departement of Biochemistry, Faculty of Medical University of Sumatera Utara, Jl. dr. Mansur Kampus USU Medan 20155, Indonesia
[2]Student of Medical Faculty of University of Sumatera Utara, Jl.dr.Mansur Kampus USU Medan 20155, Indonesia

Abstract : The purpose of this study to correlate body mass index with triglyceride levels at coronary heart disease. This study is an analytic observational by using cross sectional design. Subjects of this study were 96 people with *consecutive sampling* method. Data retrieved by observing the patient's medical record from Haji Adam Malik Hospital Medan, North Sumatera, Indonesia. The result this study showed that 60 subjects CHD (62.5%) were male and as many as 36 subjects CHD (37.5%) were women. The largest age group suffering from this disease are aged between 60 to 74 years. Obesity Type I is the highest body mass index abnormalities in patients with CHD as many as 58 subjects (60.4%). Based on the analysis by the chi-square test p-value = 0.032 for BMI with triglycerides, which means there is a significant relationship. And coclusion that excessive body mass index had a significant relationship with levels of triglycerides.
Keywords : *Coronary heart disease, body mass index, triglyceride.*

I.Introduction.

Coronary heart disease is chronic (or long term) condition that affects many people. Coronary heart disease is when your coronary arteries that supply blood and oxygen to the muscle become clogged with fatty material called plaque or atheroma. Plaque slowly builds up on the inner wall of the arteries, causing them become the narrow . This process called atherosclerosis. Atheroslerosis is a process that can involves the coronary arteries it results in coronary disease.. The plaqueis made up of fat, cholesterol , calcium, and other substances found in the blood. If the arteries become too narrow, the blood supply to the heart muscle is reduce. The an area of the plaque can rupture, causing a blood clot to form on the surface of the plaque. If the clot becomes large enough, it can mostly or completely block the flow of oxygen rich blood to the part of the heart muscle fed by the artery. This can lead to angina or a heart attack.

The prevalence of obesity in Indonesia increasingly.Base of survey of Rikerdas at the 2013, increasing obesity for adult males from 13,9% at 2007 become 19,7%, for adult females kenaikan yang sangatekstrimmencapai 18,1%, dari 14,8% padatahun 2007 menjadi 32,9%.[7]*Overweight*or obesity tend to occur together with dislipidemia. It is caused by poor life stylesi and visceral fat accumulation so encourage development insulin resistance.[8]Dislipidemiais lipid metabolism disorder, increasing or decreasing lipid fraction in the plasma. The main disorder lipid fraction is increasing total cholesterol levels, LDL cholesterol, Lipoprotein A, increasing triglyceride levels and decrease HDL level.[9]

Increasing body mass index, so increasing the more likely the occurrence of lipid profile abnormaities.Amoung60%-70% obesity and 50%-60%*overweight*were dislipidemia.[10]Determination obesity base on the measured weight with dengan body mass index (BMI),weight badanin kilogram divide height in meter squared (kg/m^2), waist size, (as visceral fat index,in cm), and waist-hip ratio,and skinfold thickness (cm). BMI > 28 kg/m^2 increasing risk morbidity like hypertension, stroke, ischemic heart disease till 3 to 4 times greater than general population.[11]

The main cause of coronary heart diseases narrow of major coronary artery proximal part by atherosclerosis.When mayor coronary artery luminal diameter diminish until more than 60 to 70% and cross sectional area diminish10 to 15% from normal,so it cause myocardischemic miokardwith hypoxia pain at even mild activity .

Obesity associated with increasing lipid and lipoprotein levels in the plasm. Abnormality lipid and cholesterol levels cause Memilikikadar lipid ataukadar kolesterol yang abnormal dapatberbahayakarenaked uanyameningkatkanrisikopenyakit kardiovaskular.[21], dimanapadaobesitasini berhubungan denganpening giakadartrigliseridadan penurunankadar HDL [18]

Material and Method

This study was conducted from Agustus 2016 to November 2016 , doing in Haji Adam Malik Medan hospital. This research observational analytic with *Cross Sectional*design .The subject in this research with *consecutive sampling*, method.The researcher get 96 patients suitable with inclusion and exlucion criterias. The datas were get from medical record Haji Adam Malik hospital Medan. Inclusion criterias: patients with medical record with coronary heart disease at 2015 and with cholesterol total levels, cholesterol LDL, cholesterol HDL, and trigliserida data completely from result laboratorium test at coronary heart disease diagnosis , and patients with medical record incompletely rekam were exclusion criterias.

Table.1.Characteristis of Sample

Variable	Frequency	Percentase (%)
Gender		
Male	60	62.5
Female	36	37.5
Total	96	100
Age		
45 – 59 years	39	40.6
60 – 74 years	51	51.0
75 – 90 years	8	8.3
Total	96	100
Normal	17	17.7
Overweight	14	14.6
Obesitas Tipe I	58	60.4
Obesitas Tipe II	7	7.3
Total	96	100
Trigliseride		
≤ 150 mg/dl	53	55.2
> 150mg/dl	43	44.8
Total	96	100

The characteristics of the subjects of this research are shown in Table 1.Subjects in this research were male were 60 people (62,5%) and female were 36 people (37,5%), found the subjects age range 75 – 90 years old were 8,3%. The mostly age range 60 – 74 years old were51%. And 96 subjects, were obesity tipe I were 58 people (60,4%), with normal body mass index were 17 people (17,7%). Subjets with body mass index *overweight*were 14 people (14,6%) and subjects with type II obesity were 7 people (7,3%). Trigliseride levels we found 53 people ≤ 150 mg/dl and43 people with Trigliseride levels >150 mg/dl.

Table 2. Chi-Square analytic result Body Mass Index withTrigliseride levels.

		Trigliserida		**Total**	**P *value***
		Normal l (≤ 150 mg/dl)	**Over (> 150mg/dl)**		
Body MassIndex	**Normal (<25kg/m^2)**	22 70,9%	9 29,1%	31 100%	0,032
	Over (≥25kg/m^2)	31 47,6%	34 52,4%	65 100%	
Total		**53 55,2%**	**43 44,8%**	**96**	

Base on the table we know that subjects with the normal body mass index with trigliseride normal levels were 22 people (70,9%),and thesubjets with normal body mass index with over trigliseride levels were 9 people (29,1%). And then the subjects with over body mass index with normal trigliserida levels were31 people (47,6%), and the other34 people (52,4%) with over body mass index with over trigliserida levels too.

We used the statical analysis with *Chi Square* test we found *p*value =0,032 (p<0,05),it means there is significant relationship between body mass index with dengan triglyceride levels at coronary heart disease.

Discussion

This study we found the ratio male subjects and female subjects with percentage male the more with female.Male 60 people (62,5%) and female 36 people (37,5%). This study is the same with Tracey (2012) in Manado (Indonesia)he found 61,3% the male patients with acute coronary heart disease and 38,7%female.[24]Ghanderi (2009) found the prevalency of acute coronary heart disease with obesity the morefemale (65,7%) than male (38%). The result of this difference maybe due to Ghanderin study is epidemiological studies that include various types of ethnic and many subjets.[25]

The results we found the coronary heart disease patients the most age range 60-74 years old. View the result of Tracey study (2012) show that average age at coronary heart disease 60 years old.[24]Increasing age, so prevalence of obesity will increase steadily until 50 years old (Martiem,2003).It is caused that the age > 50 years old the style of society generally more relaxed and more stable economically, intake the high fat but low fiber (vegetables and fruits).[26]

The obesity close relation with increasing cardiovascular disease. An individul determined as obese based on Body Mass Index (BMI) it is a simple index of weight–height relationship calculated as weight in (kg) divided by height in (m) squared. An individual is called obesity if the BMI ≥30 kg/m^2, for Asian people obesity is definied if BMI>25 kg/m^2.[27]Base on the study result found that coronary heart disease the most obesity type I (60,4%). The results of this study are consistent with the theory by *American Heart Association* (AHA) that obesity is classified as major modification risk factor[1].Wilson (2002) states increasingly BMI so increase incidence coronary heart disease.[28]

Overweight prevention is the public health problem. It must be done by healthy lifestyle, like exercise, intake the food high in energy and intake fiber.[26]

Base on table 2 shows that there is significance relation between body mass indexwith triglyceride levels (p=0,032).According to research Rustika (2014)High triglyceride had risk 1,5at obesity coronary heart

disease respondents PJK,the possibility of subjects diagnosed with coronary heart disease (with obesity) was also diagnosed Diabetes Mellitus..[32]The research in Padang (West Sumatera) get high trigyceride levels (≥ 200 mg/dl) for obesitay patients about 5,7% for male and 6,9% for female (Kamso, 2007).[33]

Conclusion

The result this study found significance relation between body mass index with triglyceride levelsat coronary heart disease.

References

1. American Heart Association. Coronary Artery Disease-Coronary Heart Disease. American Heart Association; 2016. Diaksesdari: http://www.heart.org/HEARTORG/Conditions/More /My Heart and Stroke News /Coronary-Artery-Disease---Coronary- Heart Disease_UCM_436416_ Article.jsp [diaksestanggal 14 April 2016].
2. National Heart, Lung, and Blood Institute. What is coronary heart disease?. National Heart, Lung, and Blood Institute; 2015. Diaksesdari: http://www.nhlbi.nih.gov/health/health-topics/topics/cad [diaksestanggal 14 April 2016].
3. American Heart Association. Heart Disease and Stroke Statistics 2016 Update. American Heart Association; 2016.
4. Blackwell DL, Lucas JW. Tables of Summary Health Statistics for U.S. Adults 2014. National Health Interview Survey, 2015. Diaksesdari: http://www.cdc.gov/nchs/nhis/SHS/tables.htm. [diaksestanggal 15 April 2016].
5. Pusat Data danInformasi Kementerian Kesehatan Republik Indonesia. Situasi Kesehatan Jantung. Pusdatin Kementerian Kesehatan RI; 2014.
6. World Heart Federation. Cardiovascular Disease Risk Factors. World Heart Federation; 2012. Diaksesdari: http://www.world-heart federation.org/fileadmin/user_upload/documents/Fact_sheets/2012/PressBackgrounderApril2012RiskFactors.pdf [diaksestanggal 15 April 2016].
7. Badanpeneliti and anpengembangankesehatankementeriankesehatan Indonesia. Penyajianpokok-pokokhasilrisetkesehatandasar 2013. Rikesdas [internet]. 2013 [cited 2016 Apr 26]. Diaksesdari: http://www.depkes.go.id/resources/download/general/pokok2%20hasil%20riskesdas%202013.pdf
8. Bays EH, Toth PP, Kris-Etherton MP, Abate N, Aronne JL, Brown VW, et al. Obesity, adiposity, and dyslipidemia: A consensus statement from the National Lipid Association. Journal of clinical lipidology. 2013 Apr: 304-383.
9. Ballantyne MC, O'Keefe HJ, Gotto MA. Dyslipidemia & Atherosclerosis Essential, 4th ed. Sudburry Massachusetts: Jones and Sudburry; 2009.
10. Feingold K, Grunfeld C. Obesity and Dyslipidemia. Endotext [internet].South Dartmouth,2015 Jun 12. Diaksesdari:http://www.ncbi.nlm.nih.gov/books/NBK305895/.
11. Lim Hadyanto, Lindarto Dharma, Zein Umar. Prinsip Farmakologi-Endokrin-Infeksi :Pengobatan Berbasis Patobiologi. Jakarta: Softmedia; 2014.
12. Hirakawa Y, L Thai-Hing, Welborn T, Kim Chang H, Ho S, Fang X, et al. The impact of body mass index on the associations of lipids with the risk of coronary heart disease in the Asia Pacific region. Elsevier. 2015 Dec 30: 79-82.
13. Coutinho T, Goel K, Coreea D, Carter ER, Hodge OD, Kragelund C, et al. Combining Body Mass Index With Measures of Central Obesity in the Assessment of Mortality in Subjects With Coronary Disease. Journal of the American College of Cardiology. 2013 Feb 5.
14. Oktavianus J, Rachmawati NA. Patofisiologikardiovaskuler. Yogyakarta: GrahaIlmu; 2014
15. Bull E, Morrell J. Simple guide: Kolesterol. Jakarta: Erlangga; 2007.
16. M Satish. Coronary heart disease in clinical practice. London: Springer-Verlag; 2005.
17. Silbernagl S, Lang F. Color atlas of patophysiology. 2nd ed. New York: Thieme; 2010.
18. Ritantono IL, Baraas F, Karo-Karo S, Roebiono SP, editors. Bukuajarkardiologi. Jakarta: BalaiPenerbitFakultasKedokteran Indonesia; 2003.
19. Soegih Rachmad R, Wiramihardja KK, editors. Obesita spermasalahandanterapiklinis. Jakarta: SagungSeto; 2009.

20. DepartemenKesehatanRepublik Indonesia. Pedomanpraktismemantaugizi orang dewasa. Jakarta: DepartemenKesehatan RI; 1994.
21. Sudoyo MA, Setiyohadi S, Alwi I, K Simadibrata M, Setiati S, editors. Bukuajarilmupenyakitdalam. Edisi V Jilid III. Jakarta: Pusatpenerbitilmupenyakitdalam FK UI; 2009.
22. Greenstein B, Wood FD. At a glance system endokrin. Edisikedua. Jakarta: Erlangga; 2010.
23. Aster JC, Abbas AK, Kumar V. Robbins basic pathology. 9th ed. Philadelphia: Elsevier Saunders; 2013.
24. Tracey CC, Lucia Panda, Starry H. Hubunganobesitasumumdanobesitassentral dengan penyakitjantungkoronerpadapasien di BLU/RSUP. Prof. Dr. R. D. Kandou Manado. Manado: Universitas Sam Ratulangi; 2012.
25. Ghandehari, H, V Le, S Kamal-Bahl, S L Bassin and N D Wong. Abdominal Obesity and The Spectrum of Global Cardiometabolic Risks in US Adults. International Journal of Obesity. 2009; 33: 239–48.
26. MawiMartiem. Indeksmassatubuhsebagaideterminanpenyakitjantungkoronerpada orang dewasaberusia di atas 35 tahun. JurnalkedokteranTrisakti. 2003; 23(3).
27. Nursalim Alvin, Yoga Yuniadi. Paradoksobesitaspadapasiengagaljantung. JurnalKardiologi Indonesia. 2011 Oktober; 32(4): 207-208.
28. Wilson PW, D'Agostino RB, Sullivan L, Parise H, KannelWB. Overweight and obesity as determinants of cardiovascular risk: the Framingham experience. Arch Intern Med. 2002 September; 162: 1867-1872.
29. Mardhotillah NF, Akbar MR, Firmansyah A. Hubunganantaralingkarpinggangdenganprofil lipid pasienpenyakitjantungkoroner di RSUP. Dr. HasanSadikin Bandung. [Disertasi] Bandung: Universitas Islam Bandung; 2014.
30. Beny Alexander. Perbedaanprofil lipid padapasieninfarkmiokardakutdanpenyakitjantung non infarkmiokardakut. Jurnal Media MedikaMuda. [Skripsi] Bandung: UniversitasDiponegoro; 2013.

*****