



The 6th International Conference on Public Health 2020



ICOPH 2020 | Virtual Conference

“Driving Innovations in Health and Healthcare in the Industrial Revolution 4.0”

23RD - 24TH NOVEMBER 2020

BOOK OF ABSTRACTS

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Book of Abstracts
6th International Conference on Public Health 2020
(ICOPH 2020)

23rd – 24th November 2020

Committee of the ICOPH - 2020

The International Institute of Knowledge Management (TIKM)

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Official website of the conference

www.publichealthconference.co

Book of Abstracts of 6th International Conference on Public Health 2020 (ICOPH 2020)

Edited by Prof. Dr. Hematram Yadav and Prof. Dr. Rusli Bin Nordin

ISBN 978-955-3605-55-9

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Published by The International Institute of Knowledge Management (TIIKM), No: 531/18, Kotte Road, Pitakotte, 10100, Sri Lanka

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MESSAGE FROM THE CONFERENCE ADVISOR ICOPH 2020



I truly believe health is a global matter. The reason is simple: health is a foundation of prosperity, stability and poverty reduction that are essential for the development of any nation. Over the years the change in addressing the health challenges cannot be overlooked. The problems about diseases and related determinants are being taken up everywhere, solutions developed, compared and evaluated. More so, it is happening with Southern and Northern collaboration. The interdependence between the two is becoming more transparent. Better modes of communication available through easier means of technology operationally facilitate making public health a global priority. Slowly, the importance of context is gaining its due relevance as local situations are specific and unique, but do have a global significance. This is how, to me, the (global) public health will evolve; ***cultural context and communication*** as the driving forces for dealing with current health challenges.

On Nov 23 and 24, 2020, we engage and e-mingle in the International Conference of Public Health (ICOPH) for its 6th edition. The theme of the conference is “*Driving innovations in Health and Healthcare in the Industrial Revolution 4.0*”, which concurs with the need our world is dealing during this ongoing COVID-19 pandemic. Every country, city, town, village and its communities are affected by this crisis. This historic time is reminding us to appreciate how far the technological advancements have come to protect the human health, however requiring acknowledgement of disparities and imbalances of a given system. Collectively as the public health professional community of practice we can rise up ***to transform the challenges into local sustainable solutions of global relevance***, making each human life valued, included and respected.

Together with the entire team of TIIKM behind this experience of ICOPH 2020, extending all the delegates and participants a memorable virtual conference which allows connections to advance into collaborations and networks supporting the context you are active in.

For the health of our people, our world...

Dr Raman Preet

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Advisor, ICOPH 2020

Deputy President, Public Health and Health Sciences, Academic Governing Body, TIIKM

MESSAGE FROM THE CONFERENCE CO-CHAIR ICOPH 2020



I am delighted to say a few words regarding the 6th International Conference on Public Health (ICOPH) organised by TIIKM on 23rd and 24th November 2020. This the 6th time we are organising the conference and due to the COVID 19 worldwide we are having a webinar for the first time. This is a two-day conference and it is specially tailored to enhance the knowledge of public health professionals, exchange information and discover new solutions to the issues during a period when so much is on hold. Participants will discuss their latest research, program implementations and other related issues to find solutions to major health challenges in their respective countries. This conference will facilitate discussions on a wide range of topics related to improving health at all levels through collaboration and open dialogue and steering tomorrow's agenda to improve research, education, healthcare, and policy outcomes.

I understand that this conference has attracted many researchers and public health specialist from many countries around the world. Some of the topics covered include child health, maternal health, occupational and environmental health, mental health, health services management, hospital management and several others. Most of the abstracts of the presentations will be included in the abstract book.

The Corona virus (COVID-19) pandemic has created worldwide panic and it is a major challenge for the health professionals to control this pandemic. Despite the public health prevention methods, the pandemic does not seem to stop. This has created new and innovative ways to control the pandemic in several countries. There is a rush to produce a vaccine but is vaccine a silver bullet? I think we need to be vigilant and keep the simple preventive measures to be ongoing such as hand washing, physical distancing etc. However, the larger problem for many countries is the economy. Despite the on-going pandemic, all sectors of the economy still have to keep moving.

This is one the major conferences in Public Health globally and it is hoped that the delegates will take advantage of making new networks to do better research and address the challenges of the new era. The abstract book will give new ideas and suggestions for some of you to start research or collaborate research with others. Besides the speakers, there will be expert speakers who will give plenary sessions and I am sure you will benefit from these sessions.

The question is can we translate some of the research into action. Can we as public health professionals address some of these issues and influence our policy makers to act. Finally, it is important to consider how our actions today will be viewed by our future generations. Hope you will enjoy the conference and have good time.

Thank you

Prof Dr. Hematram Yadav
Sr. Public Health Consultant
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MESSAGE FROM THE CONFERENCE CO-CHAIR ICOPH 2020

On behalf of the Conference Chair and Committee of the 6th International Conference on Public Health 2020 (ICOPH 2020) (Theme: Driving Innovations in Health and Healthcare in the Industrial Revolution 4.0), I would like to extend a warm welcome to all distinguished guests, keynote and plenary speakers, and delegates to this 2-day virtual international conference of ICOPH (23-24 November 2020). The initial conference dates were scheduled on 9-11 July 2020 in Bangkok, Thailand but due to the escalation of the COVID-19 Pandemic, the dates were brought forward and the delivery virtual. Special thanks to our three Keynote Speakers (ALENE H. GELBARD, PhD, Founder and Principal, ACCESS Partnerships and Adjunct Professor of Social Enterprise, American University, Washington D.C.; DR. MARIA NEIRA, Director, Department of Public Health, Environmental and Social Determinants of Health, World Health Organization; and DR. RICARDO BAPTISTA LEITE, Member of Portuguese Parliament, Founder and President – ‘UNITE – Global Parliamentarians Network to end HIV/AIDS, viral hepatitis and other infectious diseases’, Public Health Advocate, Portugal) for making time to share your vast knowledge and experiences in public and environmental health advocacy. Our special thanks to Dr. Raman Preet, Global Health and Epidemiology Unit, Umeå, University, Sweden who is our special advisor to the 6th ICOPH 2020, our Conference Academic Partner, Mr. Catur Setiyan Sulistiyana (Dean, Faculty of Medicine, Universitas Swadaya Gunung Jati, Indonesia), and Plenary Speaker, Dr. Saira Mehnaz (Aligarh Muslim University, India).

I take this opportunity to thank everyone for making time to participate in this annual congregation, noting how successful we have been in past conferences. Previously, the conferences were fully face-to-face, allowing for real human interface and connectivity, and enjoying the warmth and hospitality of the host nations and providing opportunities for much needed vacation for accompanying family members and loved ones. Now that we have become used to becoming virtual humans, let's not forget that behind the virtual, online façade are real people that are eager to engage meaningfully through the digital and virtual media. For making real effort to connect all of us through this virtual conference, I must thank the Convener, Mr Isanka Gamage, Managing Director of TIIKM (The International Institute of Knowledge Management) and his really hard working team for their tremendous work in putting together an inspiring international public health conference and getting people across the globe to meet and share their knowledge and invaluable experiences. Our gratitude to our Conference Secretary, Ms. Natashya Kodituwakku, for making sure that the conference is on track.

This conference provides tremendous opportunity for networking with researchers from various countries and sharing research work in an increasingly critical and congested public health arena. We should take note of the objectives of the 6th ICOPH 2020:

- Creating a platform for knowledge sharing, collaboration, and relationship building by bringing academia, policy and industry together;
- Delivering the latest research, program implementations and workforce developments related to the 4th Industrial Revolution (IR 4.0);
- Finding solutions to major health challenges of the world and set health agendas worldwide; and
- Encouraging delegates to work together to achieve better health outcomes by establishing a unique public health network.

The COVID-19 Pandemic has catapulted public health medicine into mainstream discourse. Public health intervention in ‘flattening the pandemic curve’ is already a global clarion call and the standard operating procedure of social distancing, masking, and washing is becoming the ‘new normal’ across the globe. Many countries are currently facing the second and third waves of the COVID-19 Pandemic and current restrictions on movement have had significant and severe impact on national and international economies. Let us pray and hope that the Pandemic will be controlled soonest. News about the availability of COVID-19 vaccines have already raised hopes of salvation in many countries.

I wish all the very best and looking forward to our conference on the 23-24 November 2020. Cheers!



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21 November 2020
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[82]

THE RELATIONSHIP OF DISLIPIDEMIA AND PREDIABETES MELLITUS IN INDONESIA

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ABSTRACT

Diabetes mellitus has now become one of the major health problems in the world and even in Indonesia, the prevalence of diabetes has reached 11.8%. One of the causes of the increase in type 2 diabetes mellitus is due to the high prevalence of prediabetes which is 44%, and then 5-10% will develop into diabetes. On the other hand, the incidence of hypercholesterolemia is also high, reaching 35.9% in the year 2018. This study aims to find out the relationship between dyslipidemia with prediabetes and diabetes. Data obtained from Indonesia's basic health research year 2013, as many as 20,213 subjects aged between 15-65 years old. The results show that prevalence of prediabetes = 44.97%, type 2 diabetes mellitus = 12.18%. Percentage of dyslipidemia = 33.89% (hypercholesterolemia), LDL at risk = 77.61% and HDL at risk = 39.63%. There was a relationship between gender, age, dyslipidemia (total cholesterol, HDL and LDL) and prediabetes and type 2 diabetes mellitus. Conclusion: Dyslipidemia must be one of the serious concerns in efforts to reduce prediabetes and diabetes.

Keywords: prediabetes, type 2 diabetes, dyslipidemia

THE RELATIONSHIP OF DISLIPIDEMIA AND PRE-DIABETES MELLITUS IN INDONESIA

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Abstract: Diabetes mellitus has now become one of the major health problems in the world and even in Indonesia, the prevalence of diabetes has reached 11.8%. One of the causes of the increase in type 2 diabetes mellitus is due to the high prevalence of pre-diabetes which is 44%, and then 5-10% will develop into diabetes. On the other hand, the incidence of hypercholesterolemia is also high, reaching 35.9% in the year 2018. This study aims to find out the relationship between dyslipidemia with pre-diabetes and diabetes. Data obtained from Indonesia's basic health research year 2013, as many as 20,213 subjects aged between 15-65 years old. The results show that prevalence of pre-diabetes = 44.97%, type 2 diabetes mellitus = 12.18%. Percentage of dyslipidemia = 33.89% (hypercholesterolemia), LDL at risk = 77.61% and HDL at risk = 39.63%. The most influential factor for pre-diabetes and type 2 diabetes mellitus is age (>45years), RR= 1.82 (95% CI =1.71-1.92) and RR= 3.48 (95% CI = 3.17-3.81), respectively. There is a relationship between gender, age, dyslipidemia (total cholesterol, HDL and LDL) with pre-diabetes and type 2 diabetes mellitus. Conclusion: Dyslipidemia must be one of the serious concerns in efforts to reduce pre-diabetes and diabetes.

Keywords: Pre-diabetes, type 2 diabetes, dyslipidemia.

Introduction

Prevalence of diabetes mellitus (DM) shows a rising trend lately especially at age >15 years old. Based on the 2013 National basic health research, the prevalence of type 2 diabetes was 11.8% at the age of 15-65 years. ¹ Based on the same data in year 2007, the numbers of impaired glucose tolerance (IGT) aged >15 years was 10.2%. The prevalence of DM is 6.4% (female) and 4.9% (male). The proportion of IGT at age 15-24 reaches 5.3%. The prevalence increases sharply at the age of 35-54 years. The determinant factors for IGT and diabetes are age, smoking, obesity, central obesity and hypertension. ² (2) The other research conducted by Pramono, the prevalence of DM was 5.6% in the population aged >15 years in 2007, and the prevalence of undiagnosed diabetes 4.1% of the total diagnosed DM, and the prevalence of *impaired glucose tolerance (IGT)* reaches 10.0%. ³

The term of dyslipidemia is a disorder of lipoprotein metabolism, including lipoprotein excess and deficiency. It may be manifested by total cholesterol, low density lipoprotein (LDL), and triglyceride concentration elevation and decreased high density lipoprotein (HDL) concentration. ^{4,5}

Pre-diabetes problems

Pre-diabetes is defined as a condition where the results of blood sugar tests during fasting (*fasting plasma glucose*) are 100-125 mg/dL or blood glucose values 2 hours postprandial 140-199 mg / dL. Meanwhile

according to the value of A1C level = 5.7% - 6.4% as pre-diabetes. In pre-diabetes, the value of glucose levels is quite high, but can't be categorized as diabetics. If risk factors continue to persist in a person with pre-diabetes, then he or she will suffer from diabetes in the future.

About 5-10% of people with pre-diabetes will develop diabetes, and vice versa can also return to normal. An increase in the prevalence of pre-diabetes is increasing worldwide and it is estimated that around 470 million people will suffer from pre-diabetes by 2030. ⁶ The prevalence of pre-diabetes is 7.3% and diabetes is 12.1%, the risk of pre-diabetes is associated with obesity/overweight, hypercholesterolemia, hypertension. ⁷

Hypercholesterolemia as a cause of type 2 diabetes mellitus

High levels of cholesterol are a risk factor for type 2 diabetes mellitus, hypercholesterolemia is defined as a situation in which the levels of serum triglycerides > 150 mg / dl (1.7 mmol/l), serum *high-density* lipoprotein cholesterol (HDL-c) < 40 mg / dl (1.03 mmol/l) in men and <50 mg/dL (1.29 mmol/l) in women or a history of dyslipidemia treatment. ^{4,8} Increased of total cholesterol levels will increase the risk of heart disease and stroke. Globally, one-third of the incidence of ischemia in heart disease results from high cholesterol. An overall increase in blood cholesterol estimated to cause 2.6 million deaths (4.5% of the total) and 29.7 million disability every year (*disability-adjusted life years* = *DALYs*, or 2% of the total *DALYs* . By lowering serum cholesterol at 10% a man at the age of 40 can reduce 50% of heart disease in 5 years, whereas a 70-year-old man will result in a 20% reduction in the incidence of heart disease in 5. In Ireland, a 30% reduction in heart disease deaths is contributed by a decline in average 4.6 % of total cholesterol. In Finland, a decrease of 50% of deaths caused by ischemic heart disease due to the cholesterol reduction population. ⁹

In 2008 the figure prevalent s world, total cholesterol at age adults (≥ 5.0 mmol/l) was 39% (37% male and 40% female). The highest prevalence of total cholesterol increase in Europe (54% for men and women), followed by the American region (48%). The regions of Africa and Southeast Asia are around (22.6% for Africa and 29.0% for Southeast Asia) (WHO, 2014). In America, the proportion of high LDL cholesterol (> 130 mg/dL) reaches 31.7% where the proportion of men and women is almost the same. In 1999 to 2000 a high proportion of LDL ranged from 12.9% - 18.3%. ¹⁰

According to Li's research in Taiwan in 2011 there were 5.2 % averaging 184 +/- 33.01 (men) and 5.0% averaging 179 +/- 33.17 (women) who had total cholesterol > 240 mg/dL. Meanwhile, the proportion of HDL cholesterol <40 mg/dL at 16.8 % average 49.72 +/- 11.16 (males) and 3.4% mean 61.29 +/- 13.34 (women). Triglycerides high levels of > 200 mg / dL at 13.3 % average of 130.57 +/- 103.71 (males) and 3.8% mean 86.01 +/- 58.12 (women). ¹¹ A preliminary study conducted by Djap on 216 peoples in Kepa

Duri Village, West Jakarta, 2014 found the prevalence of hypercholesterolemia when (>200mg/dL) was 35,37 %.

High insulin levels in the blood in circumstances where the occurrence of resistance to insulin will increase cholesterol levels in the blood, especially LDL (*low-density lipoprotein*) levels. High LDL levels will tend to form plaque in arteries and reduce levels of HDL (*high-density lipoprotein*). Hypercholesterolemia is a predictor of diabetes mellitus because in these conditions will occur resistance to insulin.

As a result of insulin resistance, the use of glucose by insulin-sensitive tissues will decrease, while the levels of *hepatic glucose output* increases. As blood glucose levels increase, there will be an accumulation of lipids in skeletal muscle fibers, which disrupt oxidative phosphorylation and decrease mitochondrial ATP production. As a result, many free fatty acids come out of the adipocytes resulting in an increase in lipid synthesis (VLDL and triglycerides) in hepatocytes. Lipid storage (steatosis) in the liver can lead to non-alcoholic fatty liver and liver function abnormalities, such circumstances cause dyslipidemia in type 2 diabetes mellitus, which is an increase of triglycerides, LDL, and decreased HDL. ¹²

Ectopic fat induces insulin resistance is an excess of intracellular energy in the form of diacylglycerol (DAG), which causes activation of protein kinase C (PKC θ) in muscles and PKC ϵ in the liver and subsequent inhibition of insulin signals in this tissue. Thus it can be explained that insulin resistance is associated with obesity, aging, lipodystrophy, pre-diabetes, and type 2 diabetes. Logically, insulin resistance in muscles and liver induced by DAG and nPKCs may be an autonomous cell mechanism to turn off energy storage in liver and muscle cells when excessive intracellular fat and adipose tissue storage routes. ¹³

The distribution of body fat is an additional factor that alleviates insulin resistance. Total body fat mass, accumulation of visceral adipose tissue / abdominal area and liver add to insulin resistance. This is related to inflammatory changes in the adipose depot with cytokine release. Intra-peritoneal (visceral) adipose tissue may be very damaging because it flows directly to the liver through the portal vein, causing a high concentration of FFA (*free fatty acids*) in the liver. Furthermore, visceral adipocytes appear to be more responsive to lipolytic stimulation to catecholamines and lack of suppression of lipolysis by insulin. This can increase in the flow of FFA into the muscles and liver, increasing in intramyocellular and hepatic triglyceride levels and insulin resistance. ^{14,15} Adiponectin content is inversely related to inflammatory markers and CRP (C-reactive protein) levels. ¹⁶ Epidemiological studies also obtain inversely proportional results between CRP levels and the incidence of type 2 diabetes mellitus. ¹⁷

Research purposes:

To find a picture of the incidence of pre-diabetes, type 2 diabetes, characteristics of dyslipidemia also the relationship between pre-diabetes, type 2 diabetes mellitus, and dyslipidemia.

Method

The study design was cross-sectional using the basic health research database in 2013 (Risksedas). The study population was aged 15-65 years, after cleaning the data, a total of 26,213 subjects could be analyzed. The diagnostic criteria are based according to the ADA (*American Diabetes Association*) where pre-diabetes: fasting blood sugar = 100-125 g/dL or blood sugar 2 hours postprandial = 140-199 g / dL and diabetes: fasting blood sugar \geq 126g/dL or blood sugar 2 hours postprandial \geq 200g/dL.¹⁸ The dyslipidemia criteria are based according to the *American Association of Clinical Endocrinologists and the American College of Endocrinology*.¹⁹

Research result:

Table 1. Frequency of Diabetes based by fasting and 2 hours post prandial blood glucose

Diabetes Status	n	%
Normal	11,233	42.85
Pre DM	11,787	44.97
DM	3,193	12.18
Total	26,213	100.00

Table 2. Distribution of frequency based by sex, age, total cholesterol, triglyceride, LDL, and HDL

Variable		N	%
Gender	Male	10,349	39.5
	Female	15644	60.5
Age	> 45 years old	9,957	37.98
	\leq 45 years	16,256	62.02
Total cholesterol	\geq 200 mg/dL	8,883	33.89
	<200 mg/dL	17,330	66.11
Triglyceride Levels	Risk (\geq 150mg/dL)	5,409	20.63
	No risk (<150mg/dL)	20,804	79.37
LDL levels	Risk \geq 100 mg/dL	20,343	77.61
	No risk <100 mg/dL	5870	22.39
HDL content *	Risky	10,389	39.63
	No risk	15,824	60.37

* HDL levels are at risk: - Men <40 mg/dl (1.03 mmol/L)

- Women <50 mg/dL (1.29 mmol/L)

The table above shows that the proportion of LDL lipid profiles at risk (\geq 100mg/dL) is very high, reaching 77.61 %, this is due to the projection of high total cholesterol levels (\geq 200mg/dL)= 33.89%, where generally the increase in total cholesterol is followed by high levels of LDL. The proportion of HDL at risk is also quite high (men <40mg/dL and women <50mg/dL) which reaches =39.63%. The majority of Indonesian people just have a mild physical activity (60.8 %) in which could potentially as a risk factor for obesity and then becoming pre-diabetes and diabetes incidence.

Table 3. Subject characteristics and bivariate analysis of the relationship between diabetes mellitus, pre-diabetes and normal with independent variables

Variable	Diabetes Mellitus		Pre-diabetes		Normal Reff (%)
	N (%)	PR (95% CI)	N (%)	PR (95% CI)	
Gender					
- woman	2,100 (13.23)	1.27 (1.19-1.36)	7,181 (45.27)	1.05 (1.02-1.08)	6,583 (41.5)
- man	1,093 (10.56)		4,606 (44.51)		4,650 (44.93)
Age					
- > 45 years	1,914 (19.23)	2.85 (2.68-3.03)	4,986 (50.07)	1.37 (1.33-1.40)	3,057 (30.70)
- <= 45 years	1,279 (7.87)		6,801 (41.84)		8,176 (50.29)
Total cholesterol					
- > = 200 mg / dL	1,617 (18.20)	2.18 (2.05-2.31)	4,265 (48.01)	1.23 (1.21 -1.26)	3,001 (33.79)
- <200 mg / dL	1,576 (9.09)		7,522 (43.40)		8,232 (47.51)
Triglyceride					
- > = 150 mg / dl	623 (25.72)	2.47 (2.31-2.64)	1,133 (46.78)	1.25 (1.21-1.30)	666 (27.50)
- <150 mg / dl	2,570 (10.80)		10,654 (44.78)		10,567 (44.42)
LDL					
- > = 100 mg / dL	2,738 (13.46)	1.91 (1.74-2.09)	9,391 (46.16)	1.21 (1.17-1.25)	8,214 (40.38)
- <100 mg / dL	455 (7.75)		2,396 (40.82)		3,019 (51.43)
HDL					
- Risky (low)	1,626 (15.65)	1.63 (1.53-1.73)	4,779 (46.01)	1.11 (1.08-1.14)	3,983 (38.34)
- No risk (high)	1,567 (9.90)		7,008 (44.28)		7,250 (45.82)

PR = prevalence ratio

Table 4. Multinomial logistic regression analysis, pre-diabetes and type 2 diabetes mellitus compared to the healthy group

	RRR	Std. Err	z	p> (z)	95% Conf. the interval	
Pre-diabetes						
HDL	0.99 5	0.001	-4.31	0.000	0.992	0.997
LDL	1.003	0.000	7.70	0.000	1.003	1.004
Triglyceride	1.002	0.000	9.36	0.000	1.002	1.003
Gender	0.849	0.25	-5.53	0.000	0.802	0.900
Age (> 45 yrs)	1.815	0.054	19.96	0.000	1.71 2	1.924
Cons	0.651	0.054	-5.20	0.000	0.55 4	0.765
Diabetes						
HDL	0.98 2	0.002	-9.08	0.000	0.97 8	0.985
LDL	1.008	0.001	12.79	0.000	1.00 7	1.009
Triglyceride	1.005	0.000	17.33	0.000	1.00 6	1.006
Gender	0.56 5	0.027	-11.92	0.000	0.514	0.620
Age (> 45 yrs)	3.47 6	0.161	26.86	0.000	3.17 4	3.80 7
Cons	0.90	0.012	-17.94	0.000	0.069	0.117

Discussion;

By using of the classification criteria IFG, and IGT, pre-diabetes was detected in 44.97% and diabetes 12.28% for age 15-65 years of participants, which this numbers is higher than 10.2% (pre-diabetes) and 6.4% in year 2007. ² Pre-diabetes diagnosis by Oral glucose tolerance test (OGTT) is not convenient for some people because need more time and difficult to drink 75 gram glucose water at once. But this method is still suitable for diabetes screening. After we adjusted by performing logistics regression analysis to find out the predictors of pre-diabetes and diabetes, there are all of dyslipidemia

showed associated with the risk of pre-diabetes and diabetes. This findings are relevance to many studies that pre-diabetes is associated with dyslipidemia.²⁰⁻²³ Thus, the presence of dyslipidemia was associated with the progression of developing form pre-diabetes to full type 2 diabetes.

Dyslipidemia is statistically significant as a risk factor for pre-diabetes. Triglyceride PR= **1.25** (95% CI=1.21-1.30); HDL 1.11 (1.08-1.14), LDL 1.21 (1.17-1.25),

Our result showed that dyslipidemia predominant of hypercholesterolemia, consisted of LDL levels > 100 mg/dL = 77.61 %, peoples at risky levels (39.63%), and total cholesterol (>200mg/dL) = 33.89%, meanwhile the high level of triglyceride (>150 mg/dL) = 20.63%. These numbers are quite alarming, because hypercholesterolemia has been proven as a major risk factor for cardiovascular disease and type 2 diabetes mellitus.²³⁻²⁶ When viewed from the age distribution of study subjects which included the majority of ages >= 45 years was 62.02 %. Then this condition may be influenced by socioeconomic factors in which there are changes in unhealthy lifestyles, especially the consumption of foods high in cholesterol, low physical activity.^{27,28}

The high level of dyslipidemia occurred to the full diabetes condition, but a quite lower for pre-diabetes and normal person.²³

Dyslipidemia, especially high LDL levels are risk factors for insulin resistance, resulting in hyperglycemia. In the early stages of becoming pre-diabetes, if LDL levels continue to be high then it will become type 2 diabetes later in life. High cholesterol levels are also caused by obesity, especially waist size that exceeds 80 cm (female) and 90 cm (male), where high levels of visceral fat cause an increase in free fatty acids which results in insulin resistance.^{29,30}

In multivariate analysis, it appears that age (> 45 years) as the biggest factor causing pre-diabetes (PR = 1.815; 95CI = 1.712-1.924) and diabetes (PR = 3.476; 95% CI = 3.174 – 3.807) Given that the incidence of pre-diabetes and diabetes is associated with dyslipidemia, the target of achieving cholesterol levels in the recommended treatment is as follows:

Maintain ideal body weight by doing various physical activities, reducing calorie intake so that it reaches/maintains body mass index between 18.5 - 24.9 kg/m² and waist circumference <80 cm (women) and <90 cm (men). Maintain optimal levels of fat, lipoproteins in women, namely LDL-C <100mg/dL, HDL-C >50mg/dL, triglycerides <150mg/dL, and non-HDL-C (total cholesterol minus HDL cholesterol) <130mg/dL. The level of Hb1C is attempted at the level of <7%.^{4,5,19,21}

Conclusion;

- The prevalence of dyslipidemia: LDL levels >100 mg/dL = 77.61%, Level of risky HDL = 39.63%, and total cholesterol (>200mg/dL) = 33.89%, and level of triglyceride (>150 mg/dL) = 20.63%.
- The prevalence of pre-diabetes = 44.97% and diabetes mellitus 12.18%.
- Dyslipidemia is a factor causing pre-diabetes and diabetes in Indonesia at the age of 15-65 years.
- There is a relationship between age, gender hypercholesterolemia (LDL and LDL) with pre-diabetes and type 2 diabetes mellitus.

- The most influential factor due to the occurrence of pre-diabetes and type 2 diabetes mellitus is age factors (>45years), RR= 1.82 (95% CI=1.71-1.92) and RR= 3.48 (95% CI = 3.17-3.81), respectively.

Recommendation:

1. Dyslipidemia must be one of the serious concerns in efforts to reduce pre-diabetes and diabetes.
2. Need a policy for screening lipid profile to map diabetes risk in population.
3. Strengthen the management of dyslipidemia in primary health care

Acknowledgment:

Thank you to the Republic of Indonesia Health Research and Development for the 2013 basic health research (Riskesdas) data.

References:

1. Djap HS, Sutrisna B, Soewondo P, Djuwita R, Timotius KH, Trihono, et al. Waist to height ratio (0.5) as a predictor for prediabetes and type 2 diabetes in Indonesia. IOP Conf Ser Mater Sci Eng [Internet]. 2018;434:12311. Available from: <http://dx.doi.org/10.1088/1757-899X/434/1/012311>
2. Mihardja L, Delima, Manz HS, Ghani L, Soegondo S. Prevalence and determinants of diabetes mellitus and impaired glucose tolerance in Indonesia (a part of basic health research/Riskesdas). Acta Med Indones. 2009;41(4):169–74.
3. Pramono L a, Setiati S, Soewondo P, Subekti I, Adisasmita A, Kodim N, et al. Prevalence and predictors of undiagnosed diabetes mellitus in Indonesia. Acta Med Indones. 2010;42(4):216–23.
4. Rhee E, Kim HC, Kim JH, Lee EY, Kim BJ, Kim EM, et al. 2018 Guidelines for the management of dyslipidemia Cardiovascular disease in Koreans. Korean J Intern Med [Internet]. 2019;34(4):723–71. Available from: <http://kjim.org/journal/view.php?doi=10.3904/kjim.2019.188>
5. Fodor G. Primary prevention of CVD: treating dyslipidaemia. BMJ Clin Evid. 2010;2010.
6. Tabák AG, Herder C, Rathmann W, Brunner EJ, Kivimäki M. Prediabetes: a high-risk state for diabetes development. Lancet (London, England) [Internet]. 2012 Jun 16 [cited 2017 Jan 30];379(9833):2279–90. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3891203&tool=pmcentrez&rendertype=abstract>
7. Okwechime IO, Roberson S, Odoi A. Prevalence and Predictors of Pre-Diabetes and Diabetes among Adults 18 Years or Older in Florida: A Multinomial Logistic Modeling Approach. PLoS One [Internet]. 2015 Jan [cited 2017 Feb 16];10(12):e0145781. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4699892&tool=pmcentrez&rendertype=abstract>
8. Subramanian S, Chait A. Dyslipidemia in diabetes. Encycl Endocr Dis. 2018;186–98.
9. Joseph J, Svartberg J, Njølstad I, Schirmer H. Risk factors for type 2 diabetes in groups stratified according to metabolic syndrome: a 10-year follow-up of the Tromsø Study. Eur J Epidemiol [Internet]. 2011 Feb [cited 2014 Dec 8];26(2):117–24. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3043259&tool=pmcentrez&rendertype>

=abstract

10. CDC 2007. High Cholesterol. 2015. p. 1–2.
11. Li WC, Chen IC, Chang YC, Loke SS, Wang SH, Hsiao KY. Waist-to-height ratio, waist circumference, and body mass index as indices of cardiometabolic risk among 36,642 Taiwanese adults. *Eur J Nutr.* 2013;52(1):57–65.
12. Ozougwu O. The pathogenesis and pathophysiology of type 1 and type 2 diabetes mellitus. *J Physiol Pathophysiol* [Internet]. 2013 Sep 30 [cited 2014 Oct 23];4(4):46–57. Available from: <http://academicjournals.org/journal/JPAP/article-abstract/974E7B515872>
13. Shulman GI. Ectopic Fat in Insulin Resistance, Dyslipidemia, and Cardiometabolic Disease. Vol. 31. 2014.
14. Bergman M. Pathophysiology of prediabetes and treatment implications for the prevention of type 2 diabetes mellitus. *Endocrine.* 2013;43(3):504–13.
15. Kahn SE. The relative contributions of insulin resistance and beta-cell dysfunction to the pathophysiology of Type 2 diabetes. 2003;3–19.
16. Coen DA, Casper G. Inflammatory markers , adiponectin , and risk of type 2 diabetes in the Pima Indian. 2003;
17. Anthony JG, Lynne E, Jill M. Adiponectin and the Incidence of Type 2 Diabetes in Hispanics and ... 2011;
18. International Diabetes Federation. Global Guideline for Type 2 Diabetes. 2005.
19. Jellinger PS, Handelsman Y, Rosenblit PD, Bloomgarden ZT, Fonseca VA, Garber AJ, et al. American Association of Clinical Endocrinologists and American College of Endocrinology Guidelines for Management of Dyslipidemia and Prevention of Cardiovascular Disease. *Endocr Pract* [Internet]. 2017;23(Supplement 2):1–87. Available from: <http://journals.aace.com/doi/10.4158/EP171764.APPGL>
20. Al Amri T, Bahijri S, Al-Raddadi R, Ajabnoor G, Al Ahmadi J, Jambi H, et al. The association between prediabetes and dyslipidemia among attendants of primary care Health Centers in Jeddah, Saudi Arabia. *Diabetes, Metab Syndr Obes Targets Ther.* 2019;12:2735–43.
21. Dunn FL. Management of dyslipidemia in people with type 2 diabetes mellitus. 2010;41–51.
22. Pokharel DR, Khadka D, Sigdel M, Yadav NK, Acharya S, Kafle R, et al. Prevalence and pattern of dyslipidemia in Nepalese individuals with type 2 diabetes. *BMC Res Notes.* 2017;1–12.
23. Li Y, Zhao L, Yu D, Ding G. The prevalence and risk factors of dyslipidemia in different diabetic progression stages among middle-aged and elderly populations in China. *PLoS One.* 2018;13(10):1–12.
24. Frank B. Genetic Predisposition to Dyslipidemia and Type 2 Diabetes Risk in Two Prospective Cohorts. 2012;
25. Article T, Disorders L. Diabetic dyslipidemia or “ diabetes lipidus ”? 2011;
26. Gouni-Berthold I, Betteridge D, Krone W. Dyslipidemia and Diabetes. *Type 2 Diabetes.* 2007. p. 405–16.
27. Lee TC, Glynn RJ, Peña JM, Paynter NP, Conen D, Ridker PM, et al. Socioeconomic status and

- incident type 2 diabetes mellitus: Data from the women's health study. *PLoS One*. 2011;6(12).
28. Demakakos P, Marmot M, Steptoe A. Socioeconomic position and the incidence of type 2 diabetes: The ELSA study. *Eur J Epidemiol*. 2012;27(5):367–78.
 29. D'adamo E, Caprio S. Type 2 Diabetes in Youth: Epidemiology and Pathophysiology. *Diabetes Care*. 2011;34(Supplement 2):S161–5.
 30. DeFronzo R a. Insulin resistance, lipotoxicity, type 2 diabetes and atherosclerosis: The missing links. The Claude Bernard Lecture 2009. *Diabetologia*. 2010;53(7):1270–87.



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ISBN 978-955-3605-55-9



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