Journal of Public Health Science Research (JPHSR)
Vol. 1, No. 2, September 2020, pp. 20 ~ 24
P-ISSN : 2716-4853 / E-ISSN : 2716-4845 / DOI :http://dx.doi.org/10.30587/jphsr.v1i2.2479

THE EFFECT OF BLOOD TYPE ON THE INCIDENCE OF DIABETES MELLITUS IN THE ELDERLY

Diah Jerita Eka Sari, Sestiono Mindiharto
University Muhammadiyah of Gresik

Article Info

Article history:

Received Jul 09, 2020
Revised Sept 11, 2020
Accepted Sept 15, 2020

Keywords:

Blood Type ,
DM disease incidence ,
Elderly

ABSTRACT

The increasing population of the elderly in the community cannot be separated from the health problems they experience. Various problems related to the decline in physical condition in the elderly will lead to various degenerative diseases . F. Degenerati disease f in elderly if not handled properly will decrease the quality of their lives so that it can increase morbidity and mortality. Various diseases degenerati f the most widely experienced by the elderly, among others, joint disorders, hypertension, mental and emotional disorders, heart disease, cataracts, stroke, and diabetes mellitus.

Diabetes afflicts many Indonesians. Every year it gets bigger in number, and this can be disastrous. Diabetes is a very dangerous disease. If not treated properly, it will cause various complications that can make people suffer and can even cause death. Complications can include nerve damage, impaired blood circulation, kidney problems, heart problems, high blood pressure, and so on.

The number of diabetics in Southeast Asia is Singapore 12.8%, Thailand 8%, Malaysia 16.6%, and in Indonesia 6.2% (IDF 2015). If in 2015 it is at number seven as a country with the highest number of diabetes patients in the world, in 2040 it is estimated that Indonesia will rise to number six. Blood type is a key to the entire immune system, and an essential explanatory factor in a person's health profile. Blood group antigen creates antibodies. Several studies on blood groups have shown that certain blood groups have a risk of certain problems or diseases related to the interaction of miscroscopic substances on the surface of red blood cells interacting with the immune system . Blood type cannot be changed, but knowing the effect of blood group on the incidence of diabetes mellitus allows for proper preventive action

Corresponding Author:

Diah Jerita Eka Sari, S.Kep, Ns., M.Kep
University Muhammadiyah of Gresik
Email : diahjes@umg.ac.id

PRELIMINARY

Background

Blood type is a special characteristic of the blood of an individual because of the different types of carbohydrates and proteins on the surface of the red blood cell membrane. In this world, there are actually around 46 types of antigens in addition to the ABO and Rh antigens (Andriyani et al, 2015).

The ABO system invented by Karl Landsteiner is the most important system in blood banking and transfusion medicine, the main antigens are called A and B, the main antibodies are anti-A and anti-B. The genes that determine the presence or absence of A or B activity are located on chromosome 9 (Ronald, 2004). Determination of blood group determines the type of agglutinogens present in cells and determines the agglutinins present in serum (Subrata, 2007). In this ABO blood group system, the principle applies which says that a person's serum will not precipitate the person's own red blood cells and other people's red blood cells of the same type. So, blood serum from people with blood type A will not agglutinate red blood cells from people with blood group A. The opposite is also true for serum with blood type B. Serum from people with blood type AB cannot precipitate type AB red blood cells. , also not able to agglutinate the red blood cells of group A or group B. Red blood cells of type O cannot be agglutinated by serum from people with blood types A, B, or AB (Sadikin, 2001)

Division of Blood Types In 1900, a doctor born in Vienna (Austria) named Karl Landsteiner distinguished human blood into 4 groups, namely blood type A, blood group B, blood group AB and blood group O. This blood group is known as the ABO blood grouping system. , the division of blood groups is based on differences in agglutinogens (antigens) and agglutinins (antibodies) on the surface membrane of red blood cells (Syamsuri, 2007).

According to Guyton (2006), in this blood group there are 2 substances that play an important role in determining blood type, namely agglutogens and agglutinins. Agglutinogens or antigens are polysaccharides that are not only found in red blood cells but also in the salivary glands, liver, kidneys, lungs, testes and semen. Red blood cells have either A, B, AB antigens or none at all on their surface. Group A has A antigens, group B has B antigens, group AB has A and B antigens, while group O does not contain antigens. The antigen is capable of producing antibodies. Individuals who have blood type AB are universal recipients (can accept all blood types) because they do not have antibodies, someone with blood type O is a universal donor (can accept all blood types) (Kee, 2002). 2.4 Basic Principles of Blood Classification The factors that determine human blood group in the form of antigens found on the outer surface of red blood cells are called agglutinogens. Anti-antigen substances are called anti or antibodies which when reacting will destroy the antigen in question is called agglutinin in serum, a natural antibody that is automatically found in the human body (Waluyo, 2010).

RESEARCH METHODOLOGY

This study was an observational analytic study with a *cross sectional* approach . The population used in this study were the elderly either suffering from diabetes mellitus or not totaling 52 people. The sampling method in this study is to use *simple random sampling.* The instrument used in this study used an observational sheet and glucotest.

Table 1. Division of Research Tasks

No.	Name	Agency of Origin	Knowledge field	Time Allocation (Hour / Week)	Job description
1	Diah Jerita Eka Sari, S.Kep, Ns., M.Kes (Chief Proposer)	Muhammadiyah Gresik University	Nursing	5	Coordinator for preparation of proposals, introduction to research areas, monitoring the data collection process, evaluating

					tabulation results and data analysis, compiling research reports, compiling research articles
2	Sestiono Mindiharto, S.KM., M.Kes (Member 1)	Muhammadiyah Gresik University	Public health	3	The person in charge of preparing proposals, collecting data, analyzing data, compiling reports and publishing research articles
3	Masruroh (Member 2)	Muhammadiyah Gresik University	Nursing	2	Assist in the preparation of proposals, data collection, data analysis, preparation of reports and publication of research articles
4	Lailatul Fitriyah (3 members)	Muhammadiyah Gresik University	Nursing	2	Assisting the preparation of the proposal, data retrieval, the analyst is the data, preparation of reports and publication of a research article

DISCUSSION

a. Blood group

The results showed that nearly half of the elderly (42 , 3 %) had blood type B, a small portion of elderly (28.8%) had type O blood, a small portion of elderly (21.2%) had blood group A and a small proportion (7 , 7%) have AB blood group.

Blood types are grouped into type A, B, AB, or O while the rhesus (Rh) status of blood is divided into negative and positive. A person's blood type is determined based on the presence or absence of antigens on red blood cells and blood plasma. The antigen functions like your body's cell recognition mark. This is so that the body can distinguish its own body cells from cells that come from outside the body. If cells with the opposite antigen enter the body, the immune system will initiate resistance against these cells that are considered foreign by producing antibodies.

Through the ABO system, blood groups are divided into 4 types, namely A, B, AB and O.

1. Blood type A has antigen A on red blood cells and produces antibodies to fight red blood cells with the antigen
2. Type B blood has B antigen on red blood cells and produces antibody A to fight red blood cells with antigen A.
3. Type AB blood has A and B antigens on red blood cells and does not have A and B antibodies in the blood plasma.

4. Type O blood has A or B antigens on red blood cells and produces A and B antibodies in the blood plasma.

Several studies have found a correlation between a number of diseases and a certain type of blood group you have. Blood type is determined by the substance in the blood (which is inherited from both parents) which is present on the outer surface of the red blood cells in the body. These microscopic substances interact with the immune system, which can affect your risk of certain diseases.

Blood type cannot be changed, but knowing the potential risks from the start will be very helpful in determining what precautions are appropriate so that they can reduce the risk of certain diseases. Actions that can be taken include adopting a healthy lifestyle and a healthy lifestyle.

b. Incidence of Diabetes Mellitus

The results showed that more than half of the elderly (51 , 9 %) did not suffer from diabetes mellitus and nearly half (48.1%) had diabetes mellitus.

Diabetes is often called by urinating sweet or diabetes, is one type of chronic disease marked by increased levels of sugar in the blood. This diabetes cannot be cured but can be controlled. Diabetes begins with an increase in sugar levels in the blood due to a disruption in the metabolic system in the body (Soedarsono 2019).

The development and progress in all aspects of areas such as economy, technology, and health impact on the rising age person's life expectancy. Increasing age life expectancy will also have an impact on the increasing number of elderly globally. This increase was also offset by various problems that were caused to individuals, families and communities, due to the decline in the condition of the elderly they were experiencing. Everyone will experience growing old with all their limitations .

The aging process is a process that occurs naturally and is characterized by a decrease or change in physical, psychological, and social conditions. Declining various organ functions make the elderly will be prone to experience a variety of health problems. In this age range, it is the most vulnerable period when an elderly person is stricken with chronic diseases and requires a long recovery. So that the process that occurs will have a negative impact on the health and quality of life of the elderly.

Diabetes mellitus is influenced by many factors, both irreversible factors such as genetics, gender and age as well as changeable factors such as lifestyle and nutritional intake. By adopting a healthy lifestyle, the factors that can be changed can be eliminated, thereby reducing the risk of developing diabetes mellitus.

c. Effect of Blood Type on the Incidence of Diabetes Mellitus

The results of the logistic regression statistical test analysis showed a value of p = 0.005, which means that blood type has an effect on the incidence of diabetes mellitus.

Blood type is a special characteristic of the blood of an individual because of the different types of carbohydrates and proteins on the surface of the red blood cell membrane . Each blood group has its own type of antigen such as blood group A which has antigen A on the surface of its cell membrane, blood group B has antigen B, blood group AB has two types of antigens, namely antigens A and B, and blood group O does not have antigens. , however, produces antibodies against A and B antigens.

The results of the above research are in line with the results of research which suggests that certain blood groups are at greater risk of experiencing diseases such as diabetes, coronary heart disease and cancer than other blood groups.

TO CONCLUDE

1. Nearly half of the elderly (42.3%) have blood type B
2. More than half of the elderly (51.9%) do not suffer from diabetes mellitus
3. There is an effect of blood type on the incidence of diabetes mellitus

SUGGESTION

1. It is important to identify blood type and risk of certain diseases based on blood group
2. The application of a healthy lifestyle can reduce the risk of certain diseases based on blood type

BIBLIOGRAPHY

Chaims Douglas. (2007). *Diabetes and decreased quality of life* . http // www. Ikkc.or.id.

Darmono. (2004 *). Diagnosis and classification of diabetes mellitus in: internal medicine textbooks* . Jakarta: FKUI.

Friedman Marilyn. (1998). *Family nursing theory and practice* . Jakarta: EGC.

Hidayat, A. Aziz Alimul. (2008). *Nursing Research Methods and Data Analysis Techniques* . Jakarta: Salemba Medika.

Ilyas, Ermita.F. (1999). *Exercise for people with diabetes in: integrated DM management* . Jakarta: EGC

Hananta, Yuda & Dietisien, Muhammad . 2011. *Early Detection and Prevention of Diabetes Millitus* ; editor: MedPress Team - cet. 1 - Yokyakarta: Media pressindo

Maryam, RS (2008). *Know Age Advanced and Maintenance* . Jakarta: Salemba Medika.

Mubarak, WI and Chayatin, N. (2009). *Public Health Sciences: Theory and Applications.* Jakarta: Salemba Medika.

Notoatmodjo, Soekidjo. (2010). *Health Research Methodology (Revised Edition)* . Jakarta: Rineka Cipta.

PERKENI. (1993). *DM management consensus in Indonesia,* Jakarta.

Potter, Patricia A. & Anne G. Perry. (2010). *Fundamental of Nursing* . Jakarta: EGC.

Rudianto. (2013). *Conquering Hypertension and Diabetes* . Jakarta: Tugu Publisher.