



Expert System Toxoplasma Gondii To Detect Disease In Women With Web Based Methods Chaining Forward

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ARTICLE INFO

ABSTRACT

Article history:

Received: 21/01/2020

Revised: 22/01/2020

Accepted: 01/02/2020

Keywords:

Toxoplasma gondii, woman,
expert systems, web-based,
forward chaining.

Cases of Toxoplasmosis in humans in Indonesia ranged from 43 to 88%, while in animals ranged from 6 to 70% depending on the type of animal and its region. Many people do not know about this disease because of lack of knowledge possessed. Based on these problems, in this study the expert system uses a web-based forward chaining method to find out information on disease symptoms and to detect early Toxoplasma Gondii in women, so as to reduce the risk of being infected with the Toxoplasma Gondii parasite. This system produces the output that the knowledge material used is based on expert knowledge. In addition, the accuracy of the results of testing this system gets a percentage of 100%.

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1. Introduction

Toxoplasma gondii was first discovered by Nicolle and Manceaux named as one of the protozoa in animal tissue Ctenodactylus Gundi are obligate parasites with host definitively cat and family Felidae other, in humans causes symptoms of miscarriage, premature birth, encephalitis fetal and mummification [1]. Toxoplasmosis cases in humans in Indonesia in 2017 ranged between 44-88%, while in animals ranged between 6-70% depending on the type of animal and its territory [2].

Many people do not know about this disease because of lack of knowledge, and considers only transmitted via cat. However, in reality many risk factors that lead to people affected by this disease. Infection in humans can occur through three main routes of transmission, ie foods that have been infected by tissue cysts, animal to human transmission, and mother to fetus has been infected with this parasite. Toxoplasma gondii is very difficult to be detected because of symptoms caused by common enough to be recognized as a dangerous disease. This parasite enters the body when the body's immunity is low. If the condition of the body's immunity was good, the parasite will be eliminated by the immune system.

Based on the background described, this research applying expert system using a web-based forward chaining method to find out information about symptoms of disease and early detection of disease Toxoplasma gondii in women, which can reduce the risk of infection by the parasite Toxoplasma gondii and provide solutions of the dangers of this parasite transmission.

2. Research methods

2.1 Expert system

Expert systems (expert systems) is a system that is trying to adopt human knowledge into a computer so that the computer can resolve the issue as was done by experts, and expert systems are well designed in order to solve a particular problem by mimicking the work of the experts [3].





2.2 forward Chaining

forward chaining is a technique discovered grooved conclusions forward, begins by giving some information (facts) which then must be answered in the facts that are known to match the IF-THEN rules that have been adjusted [4]. Based on the facts that will be matched by the IF-THEN rules, here are the rules and decision tree to be used on the system:

TABLE 1.
RULES

IF	THEN
G001, G002, G003, G004, G005, G006, G007, G010, G010, G011, G012 AND G008 AND G009	P01
	P02

In Table 1 describes the data rules that will be used the user to determine the outcome of the analysis on the disease *Toxoplasma gondii* which refers to the symptoms.

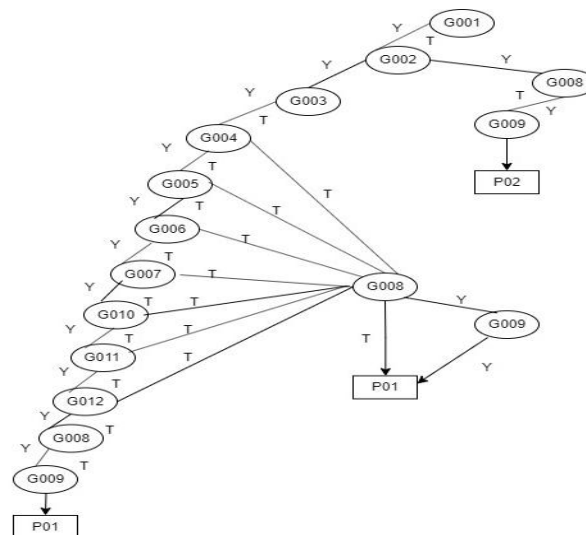


Figure 1. Decision Tree

Information :

- P01 = *Toxoplasma gondii*
- P02 = There is no indication of disease
- Y = Yes
- T = No
- G001 - G012 = Symptoms

In Figure 1 Decision tree to explain if the system user selecting symptom code G001 - G012, then the diagnosis is indicated disease *Toxoplasma gondii*. If the user of the system only select symptom code G008 and G009, then the result is no indication of the parasite *Toxoplasma gondii*.

2.3 System planning



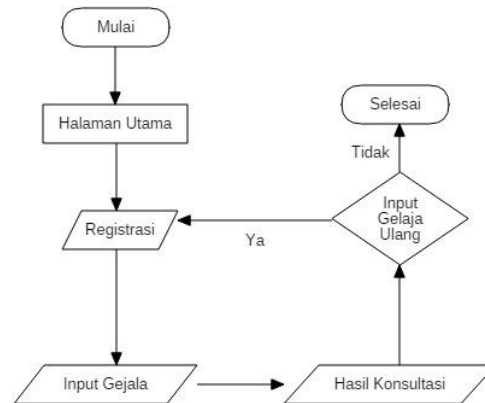


Figure 2. Flowchart system

In figure 2 explains the first phase starting from incoming main kehalaman then go to the registration, and the system will read the data from the user, the system will display the symptoms input and display the results of consultations. If the user wants to consult again, then the system will be directed to the registration menu as in the early stages. If the user does not want to do a consultation, then the program is finished.

3. Results and Discussion

3.1 Knowledge base

Facts and knowledge gained will be translated by system builders into a stored knowledge base in an expert system that is created, with the collection of data on *Toxoplasma gondii* grouping disease screening in women consist of:

TABLE 2.
TOXOPLASMA GONDII DISEASE

Kode Penyakit	Nama Penyakit
P01	Toxoplasma Gondii
P02	Tidak ada indikasi penyakit

In Table 2 contains a knowledge base about the disease as well as diseases of code in the system.

TABLE 3.
TOXOPLASMA GONDII DISEASE

Kode Gejala	Nama Gejala
G001	Memelihara kucing
G002	Kontak langsung dengan kotoran kucing
G003	Demam
G004	Kelelahan
G005	Mengonsumsi makanan setengah matang
G006	Pusing
G007	Nyeri pada otot / tulang
G008	Pelupa
G009	Penglihatan kabur
G010	Pembengkakan gelenjar getah bening
G011	Koordinasi gerakan tubuh buruk
G012	Gerakan tak terduga pada kaki/tangan

In Table 3 shows the data of *Toxoplasma gondii* and its symptoms symptom code on the system.



There are 12 symptoms that will be used on this system.

3.2 testing Accuracy

At this stage testing and expert system as many as 20 cases of the questionnaire given to the gynecologist in the Mother Hospital Margonda according to Tables 2 and 3.

TABLE 4.
TESTING SYSTEM AND EXPERT

Data	Gejala	Diagnosa Dokter	Diagnosa Sistem	Hasil
Data 1	G001,G002,G003,G004,G005,G006,G007,G010,G011,G012,G008,G009	P01	P01	S
Data 2	G001,G002, G003	P01	P01	S
Data 3	G001,G002,G003,G004	P01	P01	S
Data 4	G001,G002,G003,G004,G005	P01	P01	S
Data 5	G001,G002,G003,G004,G005,G006	P01	P01	S
Data 6	G008,G009	P02	P02	S
Data 7	G001,G002,G003,G004,G005,G006,G007	P01	P01	S
Data 8	G001,G002,G003,G004,G005,G006,G007,G010	P01	P01	S
Data 9	G001,G002,G003,G004,G005,G006,G007,G010,G011	P01	P01	S
Data 10	G008	P02	P02	S
Data 11	G001,G002,G003,G004,G005,G006,G007,G010,G011,G012	P01	P01	S
Data 12	G009	P02	P02	S
Data 13	G001,G002, G003	P01	P01	S
Data 14	G001,G002,G003,G004	P01	P01	S
Data 15	G001,G002,G003,G004,G005	P01	P01	S
Data 16	G001,G002,G003,G004,G005,G006	P01	P01	S
Data 17	G008,G009	P02	P02	S
Data 18	G001,G002,G003,G004,G005,G006,G007	P01	P01	S
Data 19	G001,G002,G003,G004,G005,G006,G007	P01	P01	S
Data 20	G001,G002,G003,G004,G005,G006	P01	P01	S

Description: S = Match

Based on data from a sample of 20 data, obtained the following results:

$$\frac{\text{Banyak data yang benar}}{\text{Banyak data sampel}} \times 100\% = \frac{20}{20} \times 100\% = 100\%$$

From the results of testing 20 samples of data., Then showed that 16 people indicated by the parasite *Toxoplasma gondii* and 4 are not indicated disease.

3.3 display Interface



Figure 3. The home page

The home page on the main page of the application is first run. On this page are logged in to the admin menu and button for manual entry into the register page.



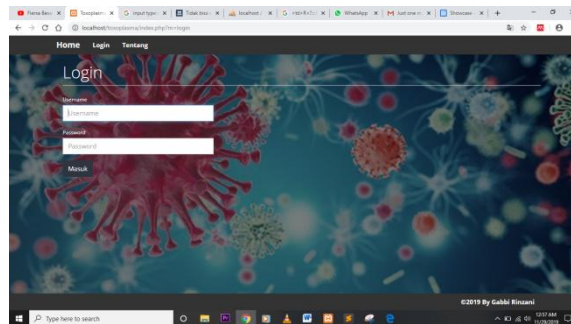


Figure 7. Admin login form

At the login form is only admins can access the system by entering a username and password. This page includes menu items such as disease, symptoms, knowledge base, rules, consultation reports, password, and log out.

4. Conclusion

Based on the results of the discussion related to the making of an expert system for *Toxoplasma gondii* mendeteksi disease in women using forward chaining method, it can be concluded that this application can help users determine whether *Toxoplasma gondii* parasite was detected or not. With this application can also be known early symptoms experienced by people with the disease *Toxoplasma gondii* that can provide solutions to users of the application. Testing accuracy of the system using a questionnaire given to the gynecologist in the Mother Hospital Margonda generate a percentage of 100%. However, of the 12 symptoms exist, if the user simply chooses 2 symptoms such as forgetfulness and blurred vision, then the results can is no indication of disease *Toxoplasma gondii*.

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