ISSN 1729-3707

ОБЪЕДИНЕННЫЙ НАУЧНЫЙ ЖУРНАЛ

THE INTEGRATED SCIENTIFIC JOURNAL

2008 № 9 (215)
сентябрь

6. *ЯрилинА.А.* – Апоптоз и его место в иммунных процессах. Иммунология 1996; №6; стр. 10-23.

РЕЗЮМЕ

Статьи «РОЛЬ ЯДЕРНО-ЦИТОПЛАЗМЕННЫХ ОТНОШЕНИЙ В ОЦЕНКЕ ЯВЛЕНИЙ АПОПТОЗА ПРИ ЭКЗЕМЕ И АЛЛЕРГИЧЕСКИХ ДЕРМАТИТАХ»

Представлены результаты изучения ядерно-цитоплазменных отношений (ЯЦО) в оценке явления апоптоза при экземе и аллергических дерматитах. Более выраженные изменение ЯЦО в шиповидных клетках связана с глубокими патологическими сдвигами, обусловленными увеличением массы цитоплазмы из-за снижения клеточного метаболизма. Произошло увеличение размеров площадей клеток и соответственно цитоплазмы, что обусловлено резкое снижение ЯЦО, особенно шиповидного слоя эпидермиса. Морфометрические ЯЦО дает основания предположить об усиление явлений патологического апоптоза при экземе.

Ключевые слова: ядерно-плазменные отношение; апоптоз; экзема, аллергический дерматит.

Поступила в редакцию 08.10.2008.

THE HYPOGLYCEMIC PROPERTIES OF BAE MACA MAX PREPARATION

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Аннотация

В настоящее время остро стоит вопрос о применении средств для снижения содержания глюкозы в крови, без возникновения побочных эффектов и токсического воздействия на организм. С этой целью в научно- исследовательской лаборатории BAE, Kuala Lumpur, Malaysia, был разработан препарат «Маса Max». Оценка гипогликемических свойств естественно модифицированных продуктов (препарата Maca Max BAE, Kuala Lumpur, Malaysia) проводилась при исследовании модели диабета у животных. В результате исследований установлено, что препарат оказывает существенное влияние как терапевтический агент, приводящий к нормализации уровня глюкозы в крови.

Abstract

An estimation of hypoglycemic properties of naturally modified product (BAE Maca Max preparation) was performed on animals in model of diabetes. The preparation exhibited a significant effect as a therapeutic agent which leads to normalization of the glucose level in the blood.

Introduction

The diabetes for a long time has passed from the category of merely medical problems in the category of common to all mankind. The population of industrially developed countries is most often suffering diabetes. Huge funds

spending both for treatment of patients and for scientific researches.

Diabetes (from Latin: diabetes mellitus) – is a group of endocrine diseases developing as a result of relative or real lack of a hormone of insulin, or disturbances of its interaction with the cells of an organism, therefore the steady increase of sugar content (glucose) in blood (hyperglycemia) develops.

Disease is characterized by chronic current and disturbances of all kinds of a metabolism (carbohydrate, fatty, albuminous, mineral and water- saline) [1].

The World Health Organization recognizes three main forms of diabetes mellitus: type 1, type 2, and gestational diabetes (occurring during pregnancy), [1] which have different causes and population distributions. While, ultimately, all forms are due to the beta cells of the pancreas being unable to produce sufficient insulin to prevent hyperglycemia, the causes are different [2]. Type 1 diabetes is usually due to autoimmune destruction of the pancreatic beta cells. Type 2 diabetes is characterized by insulin resistance in target tissues, this causes a need for abnormally high amounts of insulin and diabetes develops when the beta cells cannot meet this demand. Gestational diabetes is similar to type 2 diabetes in that it involves insulin resistance; the hormones of pregnancy can cause insulin resistance in women genetically predisposed to develop this condition.

Insulin producing in the so-called beta cells located in the pancreas by small groups which called "islets of Langerhans". A healthy adult has approximately 1 million such islets, with total weight 1-2 gram.

Along with beta cells, in pancreas islets, disposing so-called alpha-cell, which are producing a hormone glucagons acts opposite to insulin in the organism.

Insulin – is an albuminous molecule which is consist of two amino acid chains and it plays the central role in the metabolism of a person. Biological action of insulin consists, first of all, in acceleration of assimilation of sugar by cells. We shall notice, that sugar in an organism is presented only by a glucose molecule.

Glucose is used for reception of energy. Without one organs and tissues cannot carry out own tasks (for example, muscles will not be reduced). Along with it, insulin promotes receipt of amino acids in cells which are a building material for albuminous molecules, i.e. insulin also causes accumulation of albumen in the organism. Insulin also saves up and accumulates fat in the organism.

In the structure of disease incidence the diabetes of type II dominates, making 80-90 % over all population of patients. Clinical manifestation of type I and II diabetes is sharply differ.

If diabetes of type I (insulin dependent) debuts sharply with diabetic ketoacidosis, and such patients, as a rule, are hospitalized in specialized endocrine branches, the diabetes of type II (insulin independent) is more often distinguished casually: at prophylactic clinical examination, passage of the commissions, etc.

In fact for one sick by type II diabetes which has addressed for the help, there are 2-3 people in the world who are not suspecting about the illness. At the same time, at least in 40 % cases, they already suffer so-called late complications of a various degree of weight: ischemic illness of heart, retinopathy, nephropathy.

The dramatic nature and actuality of the diabetes problem are defined by wide prevalence of one, high death rate and early incapacitating of patients.

Each 15 years the number of patients is doubled. If in 1994 in the world it was totaled 120.4 million sick by a diabetes, so at the 2010 their number, by the forecasts of the experts, will increase to 239.3 million people.

The diabetes is such illness which is the doctor of any speciality inevitably meets in the practice.

Within several centuries many researchers try to solve the problem of a diabetes.

The discovery of a role for the pancreas in diabetes is generally ascribed to Joseph von Mering and Oskar Minkowski, who in 1889 found that dogs whose pancreas was removed from animals developed all the signs and symptoms of diabetes and died shortly afterwards [3]. In 1910, Sir Edward Albert Sharpey-Schafer suggested that people with diabetes were deficient in a single chemical that was normally produced by the pancreas—he proposed calling this substance insulin, from the Latin insula, meaning island, in reference to the insulin-producing islets of Langerhans in the pancreas [4].

The endocrine role of the pancreas in metabolism, and indeed the existence of insulin, was not further clarified until 1921, when Sir Frederick Grant Banting and Charles Herbert Best repeated the work of Von Mering and Minkowski, and went further to demonstrate they could reverse induced diabetes in dogs by giving them an extract from the pancreatic islets of Langerhans of healthy dogs [5].

Banting, Best, and colleagues (especially the chemist Collip) went on to purify the hormone insulin from bovine pancreases at the University of Toronto. This led to the availability of an effective treatment—insulin injections—and the first patient was treated in 1922. For this, Banting and laboratory director MacLeod received the Nobel Prize in Physiology or Medicine in 1923; both shared their Prize money with others in the team who were not recognized, in particular Best and Collip. Banting and Best made the patent available without charge and did not attempt to control commercial production. Insulin production and therapy rapidly spread around the world, largely as a result of this decision.

Today, according to annual statistical reports of World Health Organization the diabetes borrows the top lines, conceding to their cardiovascular infringements, a osteoporosis and a cancer, being one of the most widespread diseases.

It should be notice that today all preparations offered for treatment of diabetes, and especially insulin, are created for lifelong application.

Presently the additional methods of complimentary medicine which renders invaluable service for diabetic and do not render collateral action on the organism have received exclusively great development.

The given work has been directed on test the natural BAE Maca Max preparation for finding-out the opportunity of significant improvement of symptomatology of diabetes.

Materials and methods

BAE Maca Max contains two major active ingredients which are Maca and Tribulus Terresteris plants. Maca is a cruciferous root vegetable found in high land of Andrean Plateaux of Peru Survive in extreme weather. Nutritional Makeup of Maca: Carbohydrate, Proteins, Fiber, Lipids, Minerals, vitamins.

Tribulus Terresteris is a herb traditionally used in ancient India, Greece, China and Eastern Europe.

The experiments have been conducted on not purebred rats in weight of 200-250 gram (female), received from Rappolovo (Russia) nursery. During conducted experiments, animals were kept in vivarium conditions and received a standard feed.

The diabetes was modeled by way of introduction of alloxan preparation (Renal, Hungary).

Results and analysis

In the first part of experiment dozes of alloxan was worked out for modeling of easy and heavy degree of diabetes.

For a basis of the diabetes states the widespread model were taken. This model was offered by Russian physician and researcher Palchikov M.A. and colleagues in 2006. For these purposes 62 animals were used. During preliminary experiments it has been established, that an easy degree of diabetes has caused be intraperitoneal introduction of alloxan in a doze of 8 mg\100 g. At that hyperglycemia developed for 3-5 day the level of sugar in blood was on the average equaled to 7.2±0.6 mmol/liter, that is statistically significant differed from the control group of healthy rats – 5.4±0.5 mmol/liter ($P < 0.01$).

The heavy form of a diabetes developed at intraperitoneal introduction of alloxan in a doze of 17 mg\100 g. At that hyperglycemia developed for 3-5 day, and the level of sugar in blood was on the average equaled to 9.8±0.8 mmol/liter, that is statistically significant differed from the control group of healthy rats ($P < 0.01$).

The results of modeling of sugar value in the blood represented at table 1.

Glucose level in the blood was defined by unified glucose oxidant method [6]. During the basic experiment animals have been divided into three groups. The first group was made with control animals in quantity of 9 specimens. The second group represented easy of sugar diabetes in quantity of 10 animals; and third group presented 11 animals with heavy form of diabetes.

Animals received BAE Maca Max preparation in the form of drink, dissolved in 200ml potable water from standard drinking

Table 1

The level of glucose (mmol/liter) at modeling of alloxan diabetes of rats (n-quantity of animals)

Index	Control without alloxan n=9	1st group Alloxan 8 mg\100 g n=10	2nd group Alloxan 17 mg\100 g n=11
glucose	5.4±0.5 mmol/l	7.2±0.5 mmol/l	9.8±0.8 mmol/l

bowls, since 3 days of experiment (i.e. after development of hyperglycemia). The preparation was dissolved in water quite good; the solution got green color with sweet tart smell. Animals of all three groups independently used a preparation in the form of drink. A level of glucose defined before use of a preparation, for 3 days, 7 days and 10 days of experiment. Obtained data are reflected in table 2 and figure 1.

As a result of conducted experiment it was established, that in the control group (healthy rats) a gradual decrease in a level of glucose in blood was took place under influence of the preparation.

Table 2

The glucose level (mmol/liter) at alloxan diabetes of rats during use of BAE Maca Max preparation (n-quantity of animals)

Days of the experiment	Control n=9	1st group n=10	2nd group n=11
Before treatment	5.4±0.5 mmol/l	7.2±0.6 mmol/l	9.8±0.8 mmol/l
3 day	5.3±0.6 mmol/l	7.0±0.6 mmol/l	9.9±0.8 mmol/l
7 day	4.0±0.5 mmol/l*	6.0±0.6 mmol/l*	8.7±0.8 mmol/l
10 day	4.3±0.5 mmol/l**	6.2±0.6 mmol/l**	8.3±0.8 mmol/l*
	*P1<0.01 **P2<0.05	*P1<0.01 **P2<0.05	*P1<0.5

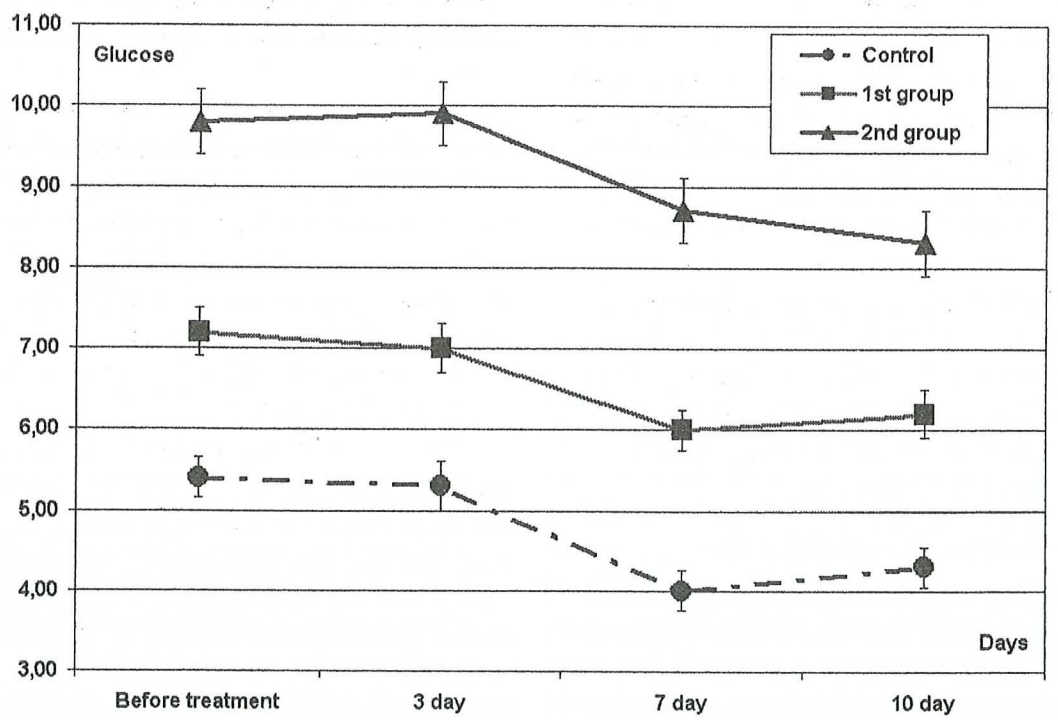

Fig. 1. Dynamic of glucose level for groups of diabetic rats treated by BAE Maca Max.

If for the third day of experiment the level of glucose was not differ from initial, then for the seventh day of experiment one was below in 1.35 times and is statistically significant differed from the control (P <0.01). For the tenth day the level of glucose increased a little and reached the value of 4.3±0.5 mmol/liter, but nevertheless was below a level of the control over 1.26 times and also, statistically significant differed from one (P <0.01).

In the first group (an easy degree of hyperglycemia) repeated the tendency which was marked in control group, there was a decrease in a level of glucose during all period of monitoring. The most essential decrease in glucose was observed for the seventh day of experiment, thus, its level was equal to 6.0±0.5 mmol/liter and statistically significant differed from the initial level in 1.2 times (P <0.01). For day 10 the level of glucose was a little above and was equaled to 6.2±0.6 mmol/liter.

In the second group (a heavy degree hyperglycemia) the level of glucose essentially did not change during all period of experiment and was in a range from 9.8±0.8 mmol/liter up to 8.3±0.8 mmol/liter. Thus, it is necessary to note, that was available steady, though also the significant tendency to decrease in a level of glucose on a background of application of BAE Maca Max preparation.

In parallel with use of BAE Maca Max preparation in groups with an easy and heavy degree of hyperglycemia, and also at healthy rats, the measurement of diabetes rats glucose at 3, 7 and 10 day of monitoring, were conducted but without treatment (the control of treatment, without BAE Maca Max preparation). Obtained data are resulted in table 3.

Table 3

The glucose level (mmol/liter) at alloxan diabetes of rats without use of BAE Maca Max preparation (n-quantity of animals)

Days of the experiment	Control n=9	1st group n=10	2nd group n=11
Before treatment	5.4±0.5 mmol/l	7.2±0.7 mmol/l	9.8±0.8 mmol/l
3 day	5.5±0.6 mmol/l	7.4±0.7 mmol/l	9.9±0.8 mmol/l
7 day	5.3±0.7 mmol/l*	7.6±0.7 mmol/l*	10.1±0.9 mmol/l
10 day	5.9±0.7 mmol/l**	8.1±0.6 mmol/l**	9.9±0.88 mmol/l*

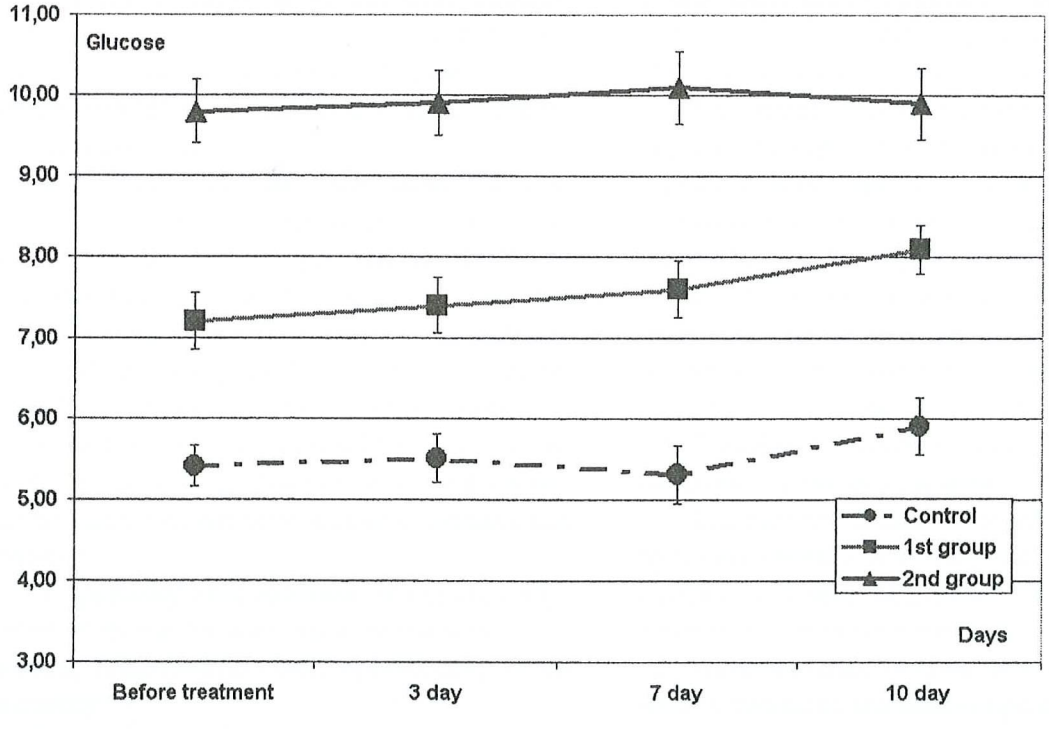

Fig. 2. Dynamic of glucose level for groups of diabetic rats without BAE Maca Max treatment.

How it follows from presented data, in the first and second groups during all period of monitoring an unstable and not significant increase in glucose in blood is having place.

Conclusions

1. BAE Maca Max preparation possesses ability to essentially reduce the level of sugar in blood under normal conditions (control group), without leading to hypoglycemia.

2. In conditions of easy hyperglycemia, the use of BAE Maca Max preparation leads to normalization of glucose in blood.

3. At expressed form (heavy form) of sugar diabetes, the BAE Maca Max preparation reduces the level of glucose a little, but does not lead it up to norm.

Acknowledgements

We thank the staff of BAE International Inc. for their participation in this study, Mr. FK Lim, director of BAE International Inc., for his continued support of scientific study of BAE.

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Поступила в редакцию 19.09.2008.