

The Investigation of Pharmacological Peculiarities of Bludiabin on Experimental Model of Insulin-dependent Diabetes Mellitus

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Abstract

Progressing the insulin-dependent diabetes mellitus maintains the further destruction of β -cells that is partly caused by the high level of glucose in blood representing the most important factor of diabetical complications. Due to this fact, to find the regulating preparations of glucose in blood is of great importance. The aim of our study is the investigation of Bludiabin and Plaferon LB, native preparations (agents) at experimental alloxan diabetes. The experiments have been carried out on white rats. To induce the insulin diabetes, the animals were injected by alloxan. Pancreas tissue micromorphological changes were studied. Studying the structure of exogenous part of pancreas on rats affected with alloxan diabetes has been shown the prevalence of connective and fat tissues. In some sites the existence of periductal necrotic areas was noticed. Definite part undergone structural and atrophic changes. Plethora of blood vessels system was revealed. Obtained results show that the preparations: Bludiabin and Plaferon LB protect pancreatic tissue from injuries with alloxan and promote the restoration of its functioning that is revealed by normalization of glucose level in blood, reduction of oxidative processes and maintaining the antioxidant enzymes activities.

Keywords: *insulin-dependent diabetes, beta-cells, hyperglycemia, Bludiabin*

Introduction

Insulin-dependent diabetes is the chronic disease characterized by insulin-producing β -cells destruction in pancreas, which in its side promotes the development of hyperinsulinemia and hyperglycemia (Yoon W., Jun H-S. 2000, Lung et al., 2000, Giugliano D., et al., 1996, Vessby J., et al., 2002).

Progressing the insulin-dependent diabetes mellitus maintains the further destruction of β -cells that is partly caused by the high level of glucose in blood representing the most important factor of diabetical complications. Due to this fact, to find the regulating preparations of glucose in blood is of great importance (Cignarella A., et al., 1996).

The aim of our study is the investigation of Bludiabin and Plaferon LB, native preparations (agents) at experimental alloxan diabetes.

Materials and Methods

The experiments have been carried out on white rats, 18-200g of weight. To induce the insulin diabetes, the animals were injected by alloxan intramuscularly with the dosage of 160mg/kg. Experimental animals were divided into three groups: 1 - alloxan diabetes, 2 - alloxan diabetes+bludiabin (intraperitoneally, with the dosage of 50mg/kg); 4 - alloxan diabetes+plaferon LB (intraperitoneally, with the dose of 0,53 mg/kg). Pancreas tissue micromorphological changes were studied. Embedding the pancreatic tissue has been made in 40% formalin solution. Tissue preparations were stained with hematoxylin-eosine.

Results and Discussion

Studying the structure of exogenous part of pancreas on rats affected with alloxan diabetes has been shown the

prevalence of connective and fat tissues. In some sites the existence of periductal necrotic areas was noticed. Definite part undergone structural and atrophic changes. Plethora of blood vessels system was revealed.

No changes were revealed in morphological picture in intact rats having been injected with Bludiabin.

During the treatment of alloxan diabetes by Bludiabin preparation, intravenously the restoration occurred in exogenous area of pancreas. The existence of periductal necrosis is not characteristic.

In most of blood vessels has been shown the aggregation of erythrocytes. The abundance in development of fat tissues is not characteristic. Mainly, building the Langerhans islands was kept, though atrophic changes were revealed in some areas. The existence of such areas is very rare. The aggregation of erythrocytes was well expressed in island capillaries.

During the treatment of alloxan diabetes with Bludiabin periorally the number of interlobular and intralobular connective tissues was increased in comparison with the intravenous injection. The number of fat tissue is increased, though unlike diabetes it's sharing has unequal character.

Had been shown the areas, where the existence of fat tissue is not characteristic. Atrophic changes in islands were insignificant. The morphological picture of alloxan diabetes treated with plaferon LB is like of the picture with Bludiabin injection. The building of endocrine area is maintained. Atrophic zones are rare. The development of fat tissue was not noticed.

So, the obtained results show that the preparations: Bludiabin and Plaferon LB protect pancreatic tissue from injuries with alloxan and promote the restoration of its functioning that is revealed by normalization of glucose level in blood, reduction of oxidative processes and maintaining the antioxidant enzymes activities.

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Исследование защитного действия фармакологических препаратов блудиабина и плаферона ЛБ на экспериментальной модели инсулинзависимого диабета

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Р Е З Ю М Е

Прогрессирование инсулинзависимого диабета способствует деструкции бета-клеток поджелудочной железы, что, в свою очередь, является одной из причин повышения уровня глюкозы в крови и способствует развитию грозных осложнений диабета. В связи с этим поиск препаратов, способных регулировать уровень глюкозы в крови, является весьма актуальной проблемой. Целью исследования являлось изучение защитного действия препаратов блудиабина и плаферона ЛБ при экспериментальном аллоксановом диабете. Эксперименты проводились на белых беспородных крысах. Для воспроизведения аллоксанового диабета животным вводился аллоксан. Исследовались микроморфологические изменения в ткани поджелудочной железы. Исследованием структуры экзогенной части поджелудочной железы крыс при аллоксановом диабете выявлено преобладание соединительной и жировой ткани. В некоторых участках обнаружены некротические повреждения. Полученные данные свидетельствуют о протекторном действии исследованных препаратов - блудиабина и плаферона ЛБ на ткань поджелудочной железы. Исследованные препараты защищают ткань поджелудочной железы от деструктивных повреждений, вызванных аллоксаном и способствуют восстановлению ее функционирования. Последнее обусловлено нормализацией уровня глюкозы в крови, восстановлением активности антиоксидантных ферментов.

Ключевые слова: *инсулинзависимый диабет, бета-клетки, гипергликемия, блудиабин*