UDC 616.98:579.841.93-098

Lipid peroxidation in patients with various forms of brucellosis

Abusueva AS[1],
Bilalova SK,
Danyalbekova ZM,
Dzhanmurzaeva AM

[1]Dagestan State Medical University, Makhachkala, Russia

Objective: To identify the clinical and pathogenetic significance of the activation of lipid peroxidation processes in brucellosis.
Materials and methods: There were examined235 patients with brucellosis at age of 15 to 72 years.The content of primary products of lipid peroxidation in the blood serum of patients with acute, subacute and chronic brucellosis was studied.
Results: It was established that in all groups of patients with brucellosis, a moderate excess of the concentration of malonic dialdehyde in the serum of the blood of patients with brucellosis was observed at the 2nd week of the disease, followed by a decrease at the 3rd week.Maximum concentrations of malonic dialdehydewere observed in patients with acute brucellosis during all periods of the disease compared with patients with subacute and chronic brucellosis.
Consequently: It has been established that the determination of only primary products of lipid peroxidation in the blood serum of patients with brucellosis does not allow to fully controlling the course of lipid peroxidation.It is advisable to evaluate the intensity of lipid peroxidation in a complex, taking into account the accumulation of the final degradation products of hydroperoxides in the blood serum.

Keywords: adolescents, anthropometry, incidence, diseases of the endocrine system, respiratory diseases,risk factors, correlation

For correspondence: Aida S. Abusueva - Candidate of Medical Sciences, Associate Professor of the Department of Infectious Diseases. Dagestan State Medical University, Russian Federation.
For citation: Abusueva AS, Bilalova SK, Danyalbekova ZM, Dzhanmurzaeva AM. Lipid Peroxidation in patients with various forms of brucellosis. Environmental medicine. 2018;1(1):45-48. DOI: 10.34662/EM.2018.1.1.45-48
Translated from Ecologicheskaya Medicina. 2018. vol. 1, N. 1(1), pp.50-53.
Translated by Kakvaeva S.B.

Brucellosis - for a long time continues to be a topical health problem in a number of southern regions of Russia, including taxiways [1, 4, 12]. Despite the relatively well-studied brucellosis, the reasons for its chronicity, immuno-pathogenesis, patterns of evolution and other aspects of the disease cannot be fully understood [4, 10, 12]. Evidence of this is intensive research conducted in this area until recently in our country and abroad [1, 3].

An infectious-immunogenetic concept of the pathogenesis of infectious diseases was put forward, based on the assumption that the nature of the infectious process and its outcome are determined, along with the conditions of infection, by a genetically determined type of interaction between the aggressors of the microorganism of the pathogen and the immunological systems. Microorganism homeostasis. Because of this, the development of methods and means of identifying and correcting defects of the human immune system becomes a priority [5, 7].

However, information on the immunopathogenesis of brucellosis is often contradictory, and interpretations are different, as are the ideas about the role of immunity factors in the pathogenesis of this disease.

In recent years, researchers have paid much attention to the clinical and pathogenetic significance of the activation of lipid peroxida-

tion (LPO) processes in various diseases [4, 8, 9, 11].

Objective: to study the clinical and pathogenetic significance of the activation of lipid peroxidation processes in brucellosis and the accumulation in this connection of lipid peroxides, which are nonspecific toxic agents.

Material and methods

Under the supervision there were 235 patients aged from 15 to 72 years. The course of lipid peroxidation (LPO) in patients with brucellosis was judged by determining in the serum of the primary products of lipid peroxidation on malonic dialdehyde, which is one of the final products of this process. The content of primary lipid peroxidation products in the serum of patients with acute, subacute and chronic brucellosis was determined at the 1st, 2nd and 3rd weeks of the survey [2, 6].

Results

The obtained results confirm that the maximum concentrations of primary lipid peroxidation (LPO) products are observed on the 1st week of the survey, i.e. in the acute period or in the period of exacerbation of subacute and chronic brucellosis. At the 2nd and 3rd weeks of the disease, in all groups of patients, there was a significant decrease in the content of primary lipid peroxidation products in the blood serum of patients compared with the 1st week of the disease (Table 1).

Table 1. The content of primarylipid peroxidation products in the serum of patients with various forms of brucellosis (M±m)

Stage of the process	Number of patients	Phase	Days of examination		
			1-7	8-14	15-22
Acute brucellosis	24	Heptane	2.4±0,2*	1,6±0,3	1,5±0,3
		Isopropanol	3,6±0,3*	2,3±0,3	2,3±0,3
Subacute Brucellosis	28	Heptane	2,3±0,3*	1,4±0,2	1,3±0,3
		Isopropanol	3,3±0,2*	2,4±0,3	2,3±0,3
Chronic brucellosis	34	Heptane	2,0±0,3*	1,2±0,3	1,2±0,2
		Isopropanol	2,9±0,2*	1,9±0,3	1,8±0,3
Control group (donors)	30	Heptane	1,0±0,1	-	-
		Isopropanol	2,1±0,2	-	-

Note: * - the differences are significant when comparing indicators with the 2nd and 3rd weeks of the survey.

One of the final decomposition products of hydroperoxides is malonic dialdehyde. In all groups of patients with brucellosis, a moderate excess of the concentration of malonic dialdehyde in the serum of patients with brucellosis was noted at the 2nd week of illness, followed by a decrease at the 3rd week. Maximum concentrations of malonic dialdehyde were observed in patients with acute brucellosis during all periods of the disease compared with patients with subacute and chronic brucellosis (Table 2).

Table 2. The content of MDA in the serum of patients with various forms of brucellosis (M ± m)

Stage of the process	Number of patients	Days of examination		
		1-7	8-14	15-22
Acute brucellosis	24	3,4±0,2	3,6±0,3	2,8±0,3
Subacute Brucellosis	28	2,9±0,2	3,,0+0,3	2,6+0,3
Chronic brucellosis	34	2,7±0,3	3,1±0,3	2,0±0,2
Control group	30	1,5±0,1	-	1,8±0,3

Findings

1. The determination of only the primary products of lipid peroxidation (LPO) in the serum of patients with brucellosis does not allow to fully controlling the course of lipid peroxidation.
2. Evaluate the intensity of the lipid peroxidation in the complex, taking into account the accumulation in the serum of the final decay products of hydroperoxides.

Funding and Conflict of Interest Information

The authors declare the absence of overt and potential conflicts of interest related to the publication of this article.

Search and analytical work on the preparation of the manuscript was carried out on the personal media of the authors.
Authors' participation: concept and design of research - A.S. Abusuyeva; collection and processing of materials - C.K. Bilalova; analysis of the data, writing the text - Z.M. Daniyalbekov; text editing - A.M. Dzhanmurzaeva.

References

1. Aligishieva MD. *Rol antioksidantnoj sistemy vrazvitii kardiodinamicheskix narushenii ubolnyx brucellezom* [The role of the antioxidant system in the development of cardiodynamic disorders in patients with brucellosis]: Avtoref. dis. … d-ra med. nauk. Maxachkala, 2000. 3-7. (In Russ.).
2. Andreeva LI, Kozhemyakin NA, Kishkun AA. Modifikaciya metodov opredeleniyaperekisejlipidov vtestestiobarbiturovojkislotoj [Modification of methods for determining lipid peroxides in the test with thiobarbi-turoic acid]. *Laboratornoe delo* 1988; 11:41–43. (In Russ.).
3. Arbulieva EA, Abusueva AS, Xairov SG, Sravnitelnaya ocenkarazlichnyx diagnostiku movvRPGApribrucelleze [Comparative evaluation of various diagnostics drugs in treponema pallidum hemagglutionation test with brucellosis]. *Mikrobiologii, epidemiologii i immunobiologii.* 1999;(4):98-99. (In Russ.).
4. Axmedov DR, Kliniko-patogeneticheskoe znachenie antioksidantnoi sistemy pri infekcionnyx zabolevaniyax [Clinical and pathogenetic significance of the antioxidant system in infectious diseases]. *Kliniche-skaya medicina*. 1994;(1):24-26. (In Russ.).
5. Blyuger AF, Veksler XM, Infekcionnoimmunogeneticheskaya koncepciya pato-geneza osnovnyx tipov infekcionnogo processa [Infectious-immunogenetic concept of pathogenesis of the main types of the infectious process]. *Materialy 3 sezda gigieni-stov, sanitarnyx vrachej, epidemiolo-gov, mikrobiologov i infekcionistov Uzbekistana*. Tashkent, MedicinaUzSSR, 1973:279-280. (In Russ.).
6. Volchegorskij IA, Nalimov AG, Yaro-vinskii BG. Sopostavlenie razlichnyx podxodov k opredeleniyu razlichnyx podxodov k opredeleniyu produktov POLv geptan-izopropanolnyx ekstraktaxkrovi [Comparison of different approaches to the definition of different approaches to the definition of lipid peroxygenation products in heptane-isopropanol blood extracts]. *Voprosy medicinskoi ximii* 1989;(1):127. (In Russ.).
7. Zhumanbaev LA, Srymbetov MS, Dzhangaliev TT. Klinika i lechenie bolnyx xronicheskim brucellezom vvozvrastnom aspekte [Clinic and treatment of patients with chronic brucellosis in the age aspect]. *Tez. Vsesoyuzn. konf. VNOI po teme: «Bakterionositelstvo i xronicheskie formy infekcionnyx boleznej»*, Minsk, 1975:182-183. (In Russ.).
8. Kulikov VYu, Semenyuk AV, Kolesnikova LI. *POLixolodovojfaktor* [lipid peroxygenation and cold factor]. Novo-sibirsk: Nauka, Sibirskoeotdelenie, 1988. 192 s.
9. Kurmanova KB. *Sovershenstvovanie me-todov lecheniya bolnyx brucellezom* [Improving methods of treating patients with brucellosis]: Avtoref. dis. … d-ra med. Nauk. M., 1990:39. (In Russ.).
10. Lyumkin GL, Tarasov MI, Taran IF. K tipizacii prirodnyx ochagov brucelleza [To the typification of natural foci of brucelle-for]. *Tez. Dokl. Nauchn. Konf. Sovremen-nye aspekty prirodnoj ochagovosti, epi-demiologii i profilaktiki osobo opas-nyx infekcionnyx boleznej.* Stavropol, 1994:77-78. (In Russ.).
11. Sulejmanov AK. *Kliniko-immunologicheskie aspekty patogeneza, lecheniya i immunoreabilitaciya bolnyx brucellezom* [Clinical and immunological aspects of pathogenesis, treatment and immunorehabilitation of patients with brucellosis]: avtoref. dis. … d-ra med. nauk. M., 1992. 48 s. (In Russ.).
12. Yushhuk ND, Vengerov YuYa, Ostrovskij NN. *Brucellez: Lekciipoinfekcionnymboleznyam* [Brucellosis: Lectures on infectious diseases]. M., 2007:413-428. (In Russ.).

Information about authors

Aida S. Abusueva – Candidate of Medical Sciences, Associate Professor of the Infectious DiseasesDepartment. Dagestan State Medical University, Russian Federation;
Saida K. Bilalova – Candidate of Medical Sciences, Associate Professor of the of Infectious DiseasesDepartment, Dagestan State Medical University, Russian Federation;
Zaira M. Daniyalbekova – Candidate of Medical Sciences, Associate Professor of the Infectious Diseases Department Dagestan State Medical University, Russian Federation;
Asiyat M. Dzhanmurzaeva – Assistant of the of Infectious DiseasesDepartment, Dagestan State Medical University, Russian Federation e-mail askamed321@mail.ru