

CHALLENGING ISSUES OF SPECIALIZED CARE DELIVERY TO VICTIMS OF BURNS IN THE KRASNODAR REGION

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BACKGROUND

The number of burn victims in Russia is growing annually. However, combustiology remains one of the few medical specialties in the country, which has no accepted procedure for the care delivery.

MATERIAL AND METHODS

The article presents an analysis of high-tech medical assistance delivery to victims of burns in the Krasnodar Region. We also consider challenging issues on combustiology services organization in Russia and economic aspects for patients with burn injury under the compulsory medical insurance.

RESULTS AND CONCLUSION

Up to 3,000 patients requiring hospital treatment are registered in the Krasnodar Region. Of 2,200 operations, 2,000 surgeries are performed in the regional burn center. Implementation of regional system of "early surgical treatment" allowed to reach some of the lowest mortality rates in Russia (in the Region: total – 2.43%, adults – 4.69%, children – 0.16%).

Keywords:

burn, treatment, transfer of patients.

BC – Burn Center

CHI – compulsory health insurance

CSG – clinical and statistical groups

ICD – International Classification of Diseases

RBC RI RCH No.1 – Regional Burn Center Research Institute - Regional Clinical Hospital No. 1

INTRODUCTION

Despite the progress of recent decades, the problem of burns remains one of the most important issues of modern medicine. According to the World Health Organization, burns are the third, and in some countries, the second highest rate among other types of injuries. In Russia, 420-450 thousand patients with thermal trauma seek medical assistance annually, of which 120,000 people are admitted to specialized surgical, trauma and burn units [1]. Children comprise up to 40% of all affected with burns. Over the past decade, there has been a number of trends in burn injuries and health care levels in Russia, which requires analysis and the effectiveness of assistance to victims of burns. In adults, there is a general decrease in the number of burns, but the trauma is more severe. In the children, there is a marked increase in the percentage of burns in the younger age group.

Today, combustiology remains one of the few medical specialties in Russia, which has no accepted procedure for medical aid delivery (www.combustiolog.ru). However, the increase in the number of burn victims, the absence of burn departments in some regions, and the need for an early transfer of victims to specialized burn beds require the organization of medical care delivery taking into account the vastness of the territory of the Russian Federation. In accordance with the RSFSR Ministry of Health Order №54 dated April 3, 1991 "On measures for further development and improvement of medical aid to victims of burns in the RSFSR", the burn beds availability should be 0.4 for 10,000 population.

The modern concept of treatment of deep burns includes early surgical treatment, which allows to improve the course and prevent the development of severe burn disease. It also contributes to quick restoration of the integrity of the skin and thus reduces mortality [2]. Early necrectomy with primary skin grafting is early rehabilitation of victims, as it has better cosmetic results and minimizes the risk of scar tissue in contrast to the skin graft on the granulating surface [3, 4].

Currently, there are two classifications for the depth of lesions in Russian burn departments and centers: three-grade International Classification of Diseases (ICD) 10 and A.A. Vishnevsky classification, which has four grades, and Grade III is divided into A and B. Modern tactics of burns, aimed at the early removal of necrotic tissue, dictates the need for a universal classification, ICD-10. Grade IIIA according A.A. Vishnevsky does not separate superficial and deep dermal burns, but the treatment outcome and timing of epithelialization differ greatly from each other. Up to 60-80% of victims admitted to hospital have borderline burns [5]. Early tangential necrectomy, dermabrasion and modern wound dressings reduced the incidence of hypertrophic scars, which is the most relevant for burns located in functionally active zones.

The problem of treatment for burns of functionally and cosmetically important areas (face, upper and lower extremities) continues to be one of the most difficult problems in combustiology and reconstructive plastic surgery,

because of the special importance of these locations in the aesthetic and functional point of view [6-9].

The forgoing demonstrates the importance and reasonability of further study of organizational issues, treatment, early transfer to specialized beds of patients with burn injury, analysis of the immediate and long-term results of treatment, and determines the relevance of the present study.

Aim of study: to develop a regional system of organization of assistance to victims of burns.

Objectives: 1) to analyze the number of patients with burn injury, hospitalized in the Krasnodar Region; 2) to develop a system for early registration of burn patients in the Krasnodar Region; 3) to create an algorithm of transfer for patients with burns from surgical and trauma beds to the Krasnodar Regional Burn Center (KRBC); 4) to study causes and terms of mortality in patients with burn injury in the Krasnodar Region.

MATERIAL AND METHODS

Forty five specialized burn beds were organized by 2016 while the normal number of beds is 206. Specialized beds were organized only at RBC RI RCH No.1. Thus, the number of beds is 0.09 for 10, 000 population.

Given the age structure, 42 specialized children and 168 adult beds are required. Since 2009, there have been 45 burn beds (20 children and 25 adults) in the Region. There is a decrease in the number of beds over time: there were 107 specialized beds in 2005.

Reduced number of burn beds is associated with some legislative acts, one of which is the order of the Ministry of Health to organize combustiologic beds in regional and territorial centers. Thus, in the major cities of Krasnodar region, such as Sochi, Novorossiysk, Armavir, Yeisk specialized burn beds have been reduced since 2005. The most pressing issue was the earlier transfer of patients to specialized beds.

In Krasnodar Burn Department and then in the Center, early surgical treatment has been adopted since 1995. In 2015, 87% of burn victims were treated by this method. The exception was patients with late arrival in hospital and victims with severe "age" comorbidity.

Since 2009, the Center has actively begun using wound dressings for all victims. Early necrectomy and dermoabrasion with wound dressings followed by self-epithelialization of burn wounds were adopted.

On August 14, 2009 the Order no. 2039 "On the improvement of care for children and adult population of Krasnodar Krai with burn trauma" was issued by the Department of Krasnodar Region in order to provide early treatment of all victims of Krasnodar Region, early transfer to specialized beds, improvement of the functional and cosmetic results of treatment in the Region. One of the main guides of the order are: the establishment of the consultation office in the Burn Center; hospitalization in trauma and surgical wards within 3 days after the injury to clean surgical beds; registration of intensive care burn patients in the Burn Center; registration of burn patients from hospitals of the Krasnodar Region with the presence of burns, requiring early surgical treatment; early surgical treatment only in the BC; autoplasty in children in the BC; autoplasty in adults (area of up to 3%) in the localities only after consultation with the BC.

Until 2014, the payment of treatment was provided with CHI based on the standards of care which regulated area, depth of the burn and the age of victims (12 children and 12 adult standards). Since 2014, standards have been replaced by clinical and statistical groups (CSG), which led to a decrease in funding for the CHI system by 69%. In 2014-2015, two groups of CSG were funded through CHI system (G 10.33.242 and G 10.33.243), which united burns and frostbite, and did not distributed patients according to the affected area (Table 1). Since 2016, 7 groups of CSG have been introduced and distributed patients according to the area and depth of lesion, with increasing rates of funding.

Table 1

Analysis of patients who died in the region (cause of death, time after the injury, age, lesion area)

		RBC RI RCH No.1	Regional districts
Total deaths - 92 (children - 3)		43 (children - 3)	49 (children - 0)
Cause of death	Burn shock	9	40
	Burn toxemia	15	9
	Sepsis and MOF	29	-
24 hours after injury	Up to 5 days	9	42
	From 6 to 10 days	15	7
	From 11 to 20 days	11	-
	From 21 and more	8	-
Distribution according to lesion area (ICD-10)	Up to 10%	2	1
	From 10 to 19%	6	3
	From 20 to 30%	4	2
	Over 30%	31	43
Distribution by age	Up to 1 year	1	-
	From 1 to 17 years	2	-
	From 18 to 29 years	3	1
	From 30 to 49 years	10	11
	From 50 and older	27	37

MOF – multiple organ failure; RBC RI RCH No.1 – Regional Burn Center Research Institute - Regional Clinical Hospital No. 1

RESULTS AND DISCUSSION

Results and indicators of treatment for patients with burn injury after the starting up of the regional order are

presented in Table. 2. The medical assistance is provided in 44 localities of the Region. Necrotomy and necrectomy are performed in districts. Skin autoplasty is performed only in adults with granulating wounds. 5.5 million people live in the Krasnodar Region. Specialized assistance is provided only in Regional Burn Center. Given the above, we consider it reasonable to analyze and compare the mortality rates not only in burn centers and departments of Russia, but also analyzing all hospitalized patients in Russia. In the Krasnodar Region, 95% mortality is observed within first 3 days after the injury and in patients older than 50 years or with a lesion area more than 50% (see Table 1).

Table 1

Indicators of medical assistance in the Krasnodar Region in 2010-2015

Number of patients	Year					
	2010	2011	2012	2013	2014	2015
Hospitalized patients in the Region						
Total	2871	2844	2872	3149	3606	3779
Children	1318	1553	1637	1711	1415	1882
Adults	1553	1587	1592	1438	2050	1897
Hospitalized patients in the regional districts						
Total	1820	1710	1722	1873	2386	2559
Children	793	919	1055	1036	780	1235
Adults	1027	1087	1006	837	1606	1324
Hospitalized patients in burn centers						
Total	1051	1134	1150	1276	1220	1220
Children	525	634	582	675	635	647
Adults	526	500	568	601	585	573
Operations performed						
Total	1709	1602	1594	2218	2117	2311
In districts	164	94	75	265	287	367
In BC	1545	1508	1519	1953	1830	1944
Lethal outcomes (children)						
Total	97 (1)	118 (8)	105 (9)	128 (10)	103 (7)	92 (3)
In districts	69 (0)	69 (4)	54 (1)	56 (2)	48 (3)	49 (0)
In BC	28 (1)	49 (4)	51 (8)	72 (8)	55 (4)	43 (3)
Lethality rate, % (adults/children)						
Region	3,38 (6,18/0,08)	3,87 (6,93/0,51)	3,66 (6,03/0,55)	4,06 (8,21/0,58)	2,91 (4,38/0,49)	2,43 (4,69/0,16)
Burn Center	2,73 (5,13/0,19)	4,32 (9,00/0,63)	4,43 (7,57/1,37)	5,64 (10,64/1,8)	4,51 (8,71/0,63)	3,5 (6,98/0,46)

Note: BC – Burn Center

During 2015, the BOC presented 1,250 cases in CHI system costing 79,866,121.67 rub. With the introduction of new tariffs and groups of CSG in January 2016, the average cost per case compared to 2015 amounted to 188% (Table 3). To optimize billing in CHI system, each region uses tariff agreements, taking into account indicators: index of supervision, index of relative input intensities, management factor and institution rate.

Table 3

Types of CSG and rates in CHI system

2015			2016		
CSG	Description of CSG	Amount, rub	CSG	Description of CSG	Amount, rub
G 10.33.242 (level 1)	1–2 cat. of superficial freezing injury, no surgeries	31 872,39	G 10.3316.275 (level 1)	1–2 cat. up to 10%	34 849,42
			G 10.3316.276 (level 2)	1–2 cat. more than 10%	58 466,40
			G 10.3316.273 (level 1)	Freezing injuries without necrosis	33 697,38
G 10.31.214 (level 2)	2–3 cat. of freezing injury with necrosis of tissues, with surgeries	67 180,60	G 10.3316.277 (level 3)	3 cat. up to 10%	101 956,17
			G 10.3316.278 (level 4)	3 cat. from 11% to 29%	150 054,14
			G 10.3316.279 (level 5)	3 cat. more than 30%	320 269,10
			G 10.3316.274 (level 2)	Freezing injuries with necrosis	83 811,43

Note: CHI – compulsory health insurance; CSG – clinical and statistical groups

CONCLUSION

When analyzing the performance of regional burn departments and centers it is reasonable to compare both department and regional indicators, taking into account all patients with thermal injury. For the development of combustiology we consider it appropriate:

1. To consider the creation of the specialty "Combustiology" which will improve the legal aspects of the legislative framework and create the department of educational medical institutions.
2. The publication of printed magazine "Combustiology" with its inclusion in the list of HAC (Higher Attestation Commission).
3. The increase in CSG payment rates in the CHI system.
4. Payment alignment for finished case in all Russian regions.
5. The high-tech health care availability for the regional centers.
6. The inclusion of high-tech operations into the payment system of CHI.

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