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ANALYSIS OF EYE INJURY IN THE REPUBLIC SAKHA (YAKUTIA)

SUMMARY

This article presents an analysis of injuries of the eye and orbit by type of injury, severity, treatment and outcomes among adults in the Republic Sakha (Yakutia) in the period from 2014 to 2015, which revealed the following: the prevalence of home injuries (99%) among which majority of them were injuries of mild severity 66.4% in 2014 and 64% in 2015.

In nosological structure of the eye injury the bruise of the eyeball and tissues of the orbit is in the first place (46% in 2014 and 47% in 2015), the foreign body outside of the eyes is in the second place (19.7% and 22%), in the third place – the injury of conjunctiva and corneal abrasion of 19.2% and 16% respectively.

Epidemiological data on the prevalence of eye injuries in the Republic Sakha (Yakutia), delayed hospitalization of emergency patients (from 40 till 70%) demonstrate the necessity for timely diagnosis and hospitalization eye care hospital to provide specialized and, if necessary, of high-technology care for patients with acute conditions and incidence of gas and orbit, especially in remote areas of the country. This requires the consolidation of all ophthalmic services in a single national center on the basis of The Yakut Republican Ophthalmologic clinical hospital with the introduction of medical information systems and telemedicine technologies to conduct remote medical consultations, consultations, teleconferences, introduction of new technologies of diagnostics and treatment methods.

Keywords: eye trauma - thermal burn, contusion, penetrating wound of the sclera and cornea.

Urgent help in any branch of medicine including ophthalmology requires immediate and specific diagnostic - therapeutic decision making. Eye and orbit injuries make up approximately 20% of organ pathology, estimated as the main cause of blindness and low vision of the able-bodied. Achievements of modern reconstructive microsurgery and suitable pharmacotherapy significantly improve the anatomical structure and visual organ functions after eye injury [3]. However, eye injury outcome is caused by many factors, one of which is timely medical emergency care [5].

The Republic Sakha (Yakutia) (RS (Y) as one of the subjects of Russia, due to its natural and territorial conditions is considered unique in the world. The republic is located in the north-eastern part of the Eurasian continent and it is the largest region of the Russian Federation (RF). The total area of the territory of Yakutia amounted at 3.1 million square kilometers is more than 40% of its territory within the Polar circle. Till nowadays Yakutia is one of the most remote and inaccessible regions of the world in relation to transport: 90% of the territory has no year-round transport links. Natural and climatic conditions of Yakutia in many respects are characterized as extreme and the coldest of the inhabited regions of the planet. The climate is continental with long winters and short summers. The absolute value of minimum temperature (down to minus 70 ° C) and its total duration (from 6.5 up to 9 months a year) have no parallel in the northern hemisphere. Among the properties that define Yakutia is extremely low population density in the vast territory occupied by the republic of about 0.3 people per 1 sq. km. The population within the republic is unevenly distributed. Climatic and economic factors have significant impact on the settlement pattern. The highest population density is characteristic for areas with relatively favorable conditions for agricultural production: the Southern, Central, Vilyusky regions, including the cities of Yakutsk and Neryungri, Mirniy with developed industry and transport scheme (1,2-2,8 persons per 1 sq. km). The lowest density of population in an area of the Arctic region with extreme climatic conditions, unfavorable for life and economic activity (0.01 - 0.08 persons per 1 sq. km.). The number of inhabitants in other regions of the country range from 0.1 to 0.9 people per 1 square kilometer . According to statistics, the total population of Sakha (Yakutia) in 2015 amounted to 956 896 people. The urban population - 64.1%, the rural - 35.9% [1, 2, 4].

The State autonomous establishment (SAE) of the Republic Sakha (Yakutia) the Yakutsk Republican Ophthalmologic Hospital (YROH) including the in-patient department with 107 beds is considered the leading eye care specialized establishment. On the basis of YROH there is an eye care emergency consulting room, equipped in accordance with orders of the Russian Federation Ministry of Health on November 12, 2012 N 902.

Besides the medical organization the medical emergency care is urgently provided by physicians and medical mobile emergency teams in accordance with the order of the Russian Health and Social Development Ministry of November 1, 2004 N 179 «On approval of the emergency medical care.» The out-patient emergency care is conducted in ophthalmic consulting rooms and clinics CRH Yakutsk. Patients with eye and orbit diseases of severe degree are taken by emergency teams to the YROH eye care emergency department. If necessary sanitary aviation brings patients from remote regions of the republic.

In order to increase the availability of specialized eye care SAE «YROH» branches in Neryungri, Nyurba, Lensk cities and Chulman, Suntar villages were set up.

Taking into account climatic and geographic features of the republic Sakha (Yakutia), the study of prevalence of eye injury, types and severity of eye and orbit injuries, as well as provided treatments and their outcomes is of great importance nowadays.

Aim: To analyze eye and orbit injuries in accordance with types of trauma, severity, treatments and outcomes among adults in the Republic of Sakha (Yakutia) from 2014 to 2015.

In the period 2014 – 2015 in the Republic of Sakha (Yakutia) 12758 patients with eye and orbit injuries were reported. Eye injury intensive index (II) among the adult population in the Sakha Republic (Yakutia) decreased from 940 to 880 per 100 000 adults in two years, i.e., 6.8%.

Table 1 shows there was decrease at 7% of the absolute number of patients with eye and orbit injuries, addressed for medical care in two years. By types of injuries 99% were resulted from by domestic trauma, industrial traumas had lower rate at 24.6% as compared 2014, criminal eye and orbit injuries were less than 0.5% of the total number of eye and orbit injuries.

Concerning the nosological structure of the eye injury the eyeball and orbital tissue injuries were on the first - 46% in

Table 1

The injury distribution by types of trauma in RS(Y) in the adult population at 18 years and over in the period 2014-2015

Trauma types	Total		Number of patients by types of trauma					
			Industrial		Home traumatism		Criminal	
	2014	2015	2014	2015	2014	2015	2014	2015
Conjunctival trauma and abrasion of the cornea	1268	994	10	9	1258	995	7	
Eyeball and orbital tissue injury	3031	2929	25	18	3006	2896	7	15
Lacerated eye wound with intraocular tissue prolapse or loss	2	1			2	1		
Lacerated eye wound without intraocular tissue prolapse or loss	4	3			4	3		
Penetrating wound of the orbit with or without intraocular foreign body	12	8			12	8		
Eyeball penetrating wound with intraocular foreign body	9	11			9	10		1
Eyeball penetrating wound without intraocular foreign body	25	25	2		23	21	1	4
Other eye and orbital injuries of lacrimal canal	31	18			31	18	5	
Foreign body in the eye outer part	1302	1364	16	8	1286	1356		
Thermal and chemical burns of ocular region	230	219	6	5	224	216		1
Other eye and orbit injuries	674	598	6	9	668	597		2
Total	6588	6170	65	49	6523	6121	21	23

2014, 47% in 2015, a foreign body in the eye outer part were on the third place - 19.7% and 22% respectively, on the third conjunctival injuries and abrasion of the cornea - 19.2% and 16%. Penetrating wounds of the eyeball constituted a small part of 0.6% over two years.

According to Table 2 among industrial accidents there was high prevalence of injuries of moderate severity, accounting for 49.2% in 2014 and 48.9% in 2015. Among home injuries the minor injuries were revealed at 66.4% and 64%, respectively. The ratio of severe injuries is small and was 0.9% and 0.8%.

At 99% patients with minor trauma of eyes and orbit injury and 92% patients with moderate severity the outpatient care was provided (taible 3).

100% patients with severe injury were admitted to the in-patient departments.

Emergency hospitalization for injuries of moderate severity was 47% in 2014 and 25% in 2015, with severe injuries of 40% and 70%, respectively.

Specific gravity of HTMC among hospitalized patients with injury of moderate severity was 13% in 2014 and 5% in 2015, with severe injury of 16% and 11%, respectively.

According to Table 4 there was recovery (0.3 VA) at 99% in 2014 and in 2015 as well. As a result one eye blindness is registered at 5 - 9 patients with penetrating injury of the eyeball, including 50% of a foreign body.

Thus, the analysis of eye and orbit injuries by types of injury, severity level, treatments and outcomes among adults in the Republic of Sakha (Yakutia) in the period 2014 to 2015 has found out:

1. Decrease of the absolute number of patients with eye and orbit injuries to 7% (from 6588 to 6170), intensive index (II) 6.8%.

2. The prevalence of home injuries (99%), moderate severity of injury making up the higher rate among them (66.4% and 64%). Penetrating wounds were noted in a lower rate (0.6%) for two years.

3. Among the industrial injuries there was predominance of moderate injuries (49.2% and 48.9%), severe injuries accounted for less than 1%.

4. As for the nosological structure of eye injury in the first place the eyeball and orbital tissue injury has been noted (46, 47%), followed by a foreign body of the outer ocular part (19.7 and 22%) and the third - conjunctival trauma and corneal abrasion (19 2 and 16%).

5. Out-patient medical care to the majority of patients with eye and orbit injuries of minor to moderate severity was provided (99% and 92%), with severe injury of 100% in the hospital.

Table 2

The injury distribution by severity level of the injury in the adult population at 18 years and over in the Sakha Republic (Yakutia), in the period 2014 – 2015

Types of trauma	Total		Number of patients by types of traumatism					
			Industrial		Home trauma		Criminal	
	2014	2015	2014	2015	2014	2015	2014	2015
Minor injury	4359	3940	28	22	4331	3921	12	10
Moderate severity	2166	2178	32	24	2134	2151	6	8
Severe trauma	63	52	5	3	58	49	3	5
Total	6588	6170	65	49	6523	6121	21	23

Table 3

The distribution by eye and orbit injury treatment among the adult population aged 18 and over in the Sakha Republic (Yakutia) in the period 2014 – 2015

Type of trauma	Total		Number of patients by								Bed-days in hospital	
			амбулатор-ное		стационар-ное		Urgently hospitalized					
							Total		HTMC*			
	Year	2015	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
	4359	3940	4319	3906	40	24	5	9			96	144
Minor injury	2166	2173	2034	2006	132	167	62	41	8	2	1056	1336
Moderate severity	63	52	-	-	63	52	25	36	4	4	672	485
Severe trauma	6588	6155	6353	5912	235	243	92	86	12	6	1824	1965
Total												

* HTMC - a high-tech medical care.

Table 4

Treatment outcomes by type of injury among adults aged 18 and over in the Sakha Republic (Yakutia) in 2014 and 2015

Trauma types	Total		Number of patients after visual acuity treatment							
			Recovery after treatment		Disablement					
					VA* lower than 0,3		в том числе			
							One eye blindness		Two eyes blindness	
	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
Eyeball and orbital tissue injury	3031	2914	3025	2926	6	2		1		
Lacerated eye wound with intraocular tissue prolapse or loss	2	1			1	1	1			
Lacerated eye wound without intraocular tissue prolapse or loss	4	3	3	3	1					
Penetrating wound of the orbit with or without intraocular foreign body	12	8	6	7	4	1				
Eyeball penetrating wound with intraocular foreign body	9	11	7	7	2	2	2	2		
Eyeball penetrating wound without intraocular foreign body	25	25	18	10	5	9	2	6		
Other eye and orbital injuries of lacrimal canal	1302	1364	1302	1364						
Foreign body in the eye outer part	230	219	228	216	2	3				
Thermal and chemical burns of ocular region	4615	4545	4589	4533	21	18	5	9		
Other eye and orbit injuries										
Total										

* VA - visual acuity.

6. Emergency hospitalization in traumas of moderate and severe injury is provided at 40 - 70% of the whole number of injuries admitted to the in-patient department . Of them, the specific gravity of HTMC ranged from 11 to 16%.

7. Recovery as the treatment outcome of patients with eye and orbit injuries was noted at 99%, blindness in one eye is fixed at 0.2%.

Epidemiological data of the prevalence of ocular injuries in the Sakha Republic (Yakutia), delayed admission of emergency patients (40 to 70%) testify to the need for timely diagnosis and hospitalization in ophthalmic hospital to handle up-to-date specialized and high-tech care for patients with eye and orbit diseases of severe degree, especially from remote areas of the country. This requires the consolidation of the entire ophthalmic services in the single republican center based in YROH with the implementation of health information systems and telemedicine technology for remote medical consultations, consuls for physicians, teleconferencing, inculcation of new technologies and methods of diagnosis and treatment.

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