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Disability caused by hip joint injuries among the adult population of Moscow in for the period of 2013–2019

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ABSTRACT

The study found that the 2013–2019 period saw a decrease in the incidence of primary disability caused by hip joint injuries among the adult population of Moscow. The level of primary disability averaged 0.09 ± 0.03 per 10,000 adult population. In the structure of disability caused by injuries of the lower limbs, hip joint injuries accounted for 10.5% over the studied period. The age structure was dominated by disabled people above the working age with a tendency to decrease their share. In the nosological structure, people disabled as a result of femoral neck fractures (46.2%) and femur fractures (29.3%) prevailed. In the structure of people who were first recognized as disabled, disabled people of groups II and III prevailed (with a large proportion of disabled people of group III and a lower share of disabled people of group II). The proportion of people with disabilities in group I is the smallest, and it tends to decrease over the studied period. Among people above the working age, the disabled people of groups I and II prevailed while among people of the working age, the disabled people of groups II and III prevailed.

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The incidence of repeated disability of this contingent was also characterized by a downward trend. The level of repeated disability averaged 0.11 per 10,000 population. The share of people repeatedly recognized as disabled due to injuries of the lower limbs was 8.5%. The structure was dominated by people with disabilities caused by femoral neck and femur fractures. The period saw an increase in the proportion of disabled people of the working age. The disabled people of group III with a tendency to increase their share and the disabled people of group II with a tendency to decrease their share prevailed, and the number of disabled people of group I decreased.

Keywords: *age groups, comparative analysis, disability, disability groups, features of disability, hip joint injuries*

The diseases of the circulatory system, malignant tumors, diseases of the musculoskeletal system, and the consequences of injuries of all locations are ranked first in the structure of disability in the Russian Federation.[1,2,6,7,10] The high rate of disability caused by injuries of the lower limbs highlights their high prevalence, poor prevention, and rehabilitation at different stages: outpatient, inpatient, and sanatorium stages.[3–5,8,9]

OBJECTIVE OF THE STUDY

To determine the features and investigate the dynamics of primary and repeated disability caused by hip joint injuries among the adult population of Moscow.

MATERIALS AND METHODS

The study is continuous. The study covers the adult residents of Moscow who were first and repeatedly recognized as disabled due to hip joint injuries. Thedata resources used are the database of the Unified Automated Vertically Integrated Information and Analytical System of the Medical and Social Expertise belonging to Federal State Institution "General Bureau of Medical and Social Expertise of Moscow" of the Ministry of Labour of the Russian Federation.

***Methods*:** Data copying, descriptive statistics (absolute, relative, extensive, intensive indicators), and analytical comparative analysis. The static reliability of different intensive indicators was determined by calculating the statistical significance criteria (t) and confidence (P) and error (p) levels.

RESULTS AND DISCUSSION

In the structure of people first recognized as disabled due to injuries, the number of people with injuries of lower limbs has increased from 8.9% to 13.0% for the 2013–2019 period (on average, 10.5% over the studied period). In Moscow, their absolute number decreased from 128 people up to 40 people (the decline rate is 68.8%) (644 people in total over the period; on average, 92 people per year). The level of primary disability caused by hip joint injuries is characterized by a downward trend (decrease from 0.12 ± 0.03 to 0.04 ± 0.03) over the researched period (on average, 0.09 ± 0.03 per 10,000 adults (See Table 1)).

In the nosological structure of primary disability caused by hip joint injuries for the researched period, femoral neck fracture (46.2%), femur fracture (29.3%), trochanteric fracture (11.7%), and bilateral post-traumatic coxarthrosis (10.3%) prevailed. The smallest proportion was that of the fracture of the lower third of the femur (1.3%), traumatic amputation at the level between the hip and the knee joint (0.7%), and traumatic amputation at the level of the hip joint (0.5%).

TABLE 1. Dynamics of the Number of People First Recognized as Disabled Due to Hip Joint Injuries in the Structure of Lower Limb Injuries in Moscow for the 2013–2019 Period (Absolute Number, %, per 10,000, M ± m)

Year	Total number of people first recognized as disabled due to lower limb injuries			Number of people first recognized as disabled due to hip joint injuries		
	Absolute number	Share	Level	Absolute number	Share	Level
2013	1438	100.0	1.4 ± 0.09	128	8.9	0.12 ± 0.03
2014	1232	100.0	1.2 ± 0.09	120	9.7	0.11 ± 0.03
2015	1103	100.0	1.1 ± 0.09	147	13.3	0.14 ± 0.03
2016	870	100.0	0.8 ± 0.09	78	9.0	0.08 ± 0.03
2017	621	100.0	0.6 ± 0.09	72	11.6	0.07 ± 0.03
2018	455	100.0	0.4 ± 0.09	50	13.0	0.06 ± 0.03
2019	401	100.0	0.4 ± 0.09	40	10.0	0.04 ± 0.03
Average value	874	100.0	0.8 ± 0.09	92	10.5	0.09 ± 0.03

TABLE 2. Dynamics of the Number of People First Recognized as Disabled Due to Hip Joint Injuries Taking into Consideration Age Groups in Moscow for the 2013–2019 Period (Absolute Number, %, per 10,000)

Year	Working age			Old working age		
	Absolute number	Share	Level	Absolute number	Share	Level
2013	18	14.1	0.02	110	85.9	0.37
2014	18	15.0	0.02	102	85.0	0.34
2015	31	21.1	0.04	116	78.9	0.37
2016	7	9.0	0.01	71	91.0	0.22
2017	17	23.6	0.02	55	76.4	0.17
2018	14	23,7	0.02	45	76.3	0.13
2019	13	32.5	0.02	27	67.5	0.08
Average value	17	18.5	0.02	75	81.5	0.24

Among people first recognized as disabled due to hip joint injuries in Moscow, the disabled people of the working age made up 18.5% on average with a tendency to increase their share from 14.1% to 32.2% in 2013–2019. Their level of primary disability was 0.02 per 10,000 of the corresponding population (See Table 2).

The number of people who were first recognized as disabled due to hip joint injuries and above the working age is significantly higher than the number of disabled people of the working age, but over the studied period, their number decreased from 110 people in 2013 up to 27 people in 2019 (526 people in total and 75 people on average per year). Their share in the structure of people first recognized as disabled due to hip joint injuries averaged 81.5%. The level of primary disability tended to decrease from 0.37 to 0.08, averaging 0.24 per 10,000 of the corresponding population.

In the structure of primary disability caused by hip joint injuries, the proportion of disabled people of group I is the smallest; over the studied period,

it tended to decrease from 25% to 10.1%, averaging 19.6%. The level of primary disability in this contingent was 0.02 per 10,000 of the adult population. The share of disabled persons of group II was also characterized by a decrease from 46.1% to 27.5%, averaging 40.2%. The absolute number of disabled people of group II was 259 people (on average 37 people per year). The proportion of the disabled with group III tended to grow from 28.9% to 60% for the researched period, averaging 40.2%. The level of primary disability in group III averaged 0.04 per 10,000 of the adult population (See Table 3).

Taking into account age categories and the severity of primary disability caused by hip joint injuries, we have revealed that the number of the disabled people of group I is higher among people above the working age than among people of working age. For the research period, their proportion was 22.4% against 1.3% ($P < 0.05$). The level of primary disability among people above the working age averaged 0.06 and among people of working age, it was 0.002. The share of the disabled people of group II among people of working age averaged 35.2% with a level equaled to 0.01. The share of the disabled people of group II among people above the working age is higher (39.1%) with a level of 0.1 per 10,000 of the corresponding population (See Table 4). The proportion of the disabled people of group III among people of working age is the highest (65.3%) against 38.5% among people above the working age ($P < 0.05$). The level of primary disability of group III among people of working age is lower (0.01) than among people above the working age (0.09). Thus, disabled people of groups I–II and groups III–IV predominate among people above the working age and among people of working age, respectively (See Table 4).

In the structure of people repeatedly recognized as disabled due to injuries of the lower limbs among the adult population, hip joint injuries amounted to 8.5% for the researched period, ranging from 7.1% to 9.7%. The number of such people repeatedly recognized as disabled decreased from 174 people up to 51 people (on average, 110 people per year) over the studied period. The level of repeated disability tended to decrease from 0.17 to 0.05, and on average it was 0.11 per 10,000 of the adult population (See Table 5).

In the nosological structure of such disabled people, femoral neck fractures (33.8%), femur

TABLE 3. Characteristics of Primary Disability Due to Hip Joint Injuries Taking into Account the Severity of Disability in 2013–2019

Year	Disability group								
	I			II			III		
	Absolute number	Share	Level	Absolute number	Share	Level	Absolute number	Share	Level
2013	31	25.0	0.03	59	46.1	0.06	38	28.9	0.04
2014	24	20.0	0.02	52	43.3	0.05	44	36.7	0.04
2015	27	18.4	0.03	60	40.8	0.06	60	40.8	0.06
2016	25	32.1	0.02	21	26.9	0.02	32	41.0	0.03
2017	8	11.1	0.01	26	36.1	0.02	38	52.8	0.04
2018	6	10.1	0.001	27	45.8	0.02	26	44.1	0.02
2019	5	12.5	0.0004	11	27.5	0.01	24	60.0	0.02
Average value	18	19.6	0.02	37	40.1	0.04	37	40.2	0.04

(Absolute Number, %, per 10,000)

TABLE 4. Structure of People First Recognized as Disabled due to Hip Joint Injuries Taking into Consideration Disability Severity and Age Categories in Moscow for the 2013–2019 Period (Absolute Number, %, per 10 000)

Year	Age category	Disability group								
		I			II			III		
		Absolute number	Share	Level	Absolute number	Share	Level	Absolute number	Share	Level
2013	Of working age	1	5.6	0.001	12	66.7	0.02	5	27.7	0.007
	Above working age	30	27.3	0.10	47	42.7	0.16	33	30.0	0.11
2014	Of working age	—	—	—	7	38.9	0.009	1	61.1	0.01
	Above working age	24	23.5	0.08	45	44.1	0.15	33	32.4	0.11
2015	Of working age	1	3.2	0.001	14	45.2	0.02	16	51.6	0.02
	Above working age	26	23.4	0.08	46	39.7	0.15	44	36.9	0.14
2016	Of working age	—	—	—	1	14.3	0.001	6	85.7	0.008
	Above working age	25	36.2	0.08	20	28.2	0.06	26	35.6	0.08
2017	Of working age	—	—	—	5	29.4	0.007	12	70.6	0.02
	Above working age	8	14.5	0.02	21	38.2	0.06	26	47.3	0.08
2018	Of working age	—	—	—	4	28.6	0.006	10	71.4	0.01
	Above working age	6	13.3	0.02	23	51.1	0.07	16	35.6	0.05
2019	Of working age	—	—	—	3	23.1	0.004	10	76.9	0.01
	Above working age	5	18.5	0.01	8	29.6	0.02	14	51.9	0.04
Average value	Of working age	03	1.3	0.0002	7	35.2	0.01	9	63.5	0.01
	Above working age	18	22.4	0.06	29	39.1	0.1	27	38.5	0.09

TABLE 5. Structure of People Repeatedly Recognized as Disabled Due to Hip Joint Injuries in the Structure of Disabled People with Lower Limb Injuries for the 2013–2019 Period (Absolute Number, %, per 10 000, M ± m)

Year	Total number of people repeatedly recognized as disabled due to injuries of the lower limbs			Number of people repeatedly recognized as disabled due to hip joint injuries		
	Absolute number	Share	Level	Absolute number	Share	Level
2013	2066	100.0	2.0 ± 0.09	174	7.1	0.17
2014	1955	100.0	1.9 ± 0.09	165	8.4	0.16
2015	1447	100.0	1.4 ± 0.09	134	9.3	0.13
2016	1310	100.0	1.3 ± 0.09	104	7.9	0.10
2017	839	100.0	0.8 ± 0.09	81	9.7	0.08
2018	759	100.0	0.7 ± 0.09	61	8.0	0.06
2019	657	100.0	0.6 ± 0.09	51	7.8	0.05
Average value	1290	100.0	1.2 ± 0.09	110	8.5	0.11

fractures (30.2%), bilateral post-traumatic coxarthrosis (19.7%), and the pertrochanteric fractures (10.4%) predominated. The smallest proportion was made up by the fractures of the lower end of the femur (1.6%), the traumatic amputation at the level between the hip and knee joints (3.3%), the traumatic amputation in the hip joint and the thigh area (0.9%), and traumatic amputation at the level of the hip joint (0.1%) (See Figure 1).

The analysis of repeated disability of the adult population due to hip joint injuries in Moscow for the 2013–2019 period taking into account the age categories showed that disabled people above the working age predominated. Over the studied period, their absolute number decreased from 132 people up to 23 people (576 people in total, 82 people on average per year). Their share grew from 75.9% in 2013 to 81.7% in 2016 with a subsequent decrease to 45.1% in 2019, averaging 75.4%. The number of disabled people of the working age is much less (194 people in total, 28 people on average per year). Their share grew from 24.1% to 54.9%, averaging 25.5%.

The level among people above the working age decreased from 0.45 to 0.07 and averaged 0.28 per 10,000 of the corresponding population. Among people of the working age, the level of repeated disability was much lower and averaged 0.04 per 10,000 of the corresponding population (See Table 6).

In the structure of repeated disability caused by hip joint injuries, the disabled people of group III prevailed. The number of people repeatedly recognized as disabled decreased from 57 people up to 31 people (with a decline rate of 45.5%). The share of such people repeatedly recognized as disabled amounted to 31.7% in 2013 and was followed by its increase to 60.8% in the subsequent years. The long-term average annual proportion was 39.1%. The level of repeated disability decreased from 0.05 to 0.03 and averaged 0.03 per 10,000 of the adult population (See Table 7).

The disabled people of group II were ranked second in the structure of people repeatedly recognized as disabled due to hip joint injuries. Their number decreased from 69 people in 2013 up to 13 people in 2019 (the decline rate was 81.2%). Their share was 39.7% in 2013 with a subsequent decrease to 25.5%, averaging 33.6%, which is higher than the extensive indicator of repeated disability of group II due to injuries of the lower limbs (19.9%) ($P < 0.05$). The level of repeated disability of such disabled people was seven-fold from 0.07 to 0.01, averaging 0.04 per 10,000 of the adult population.

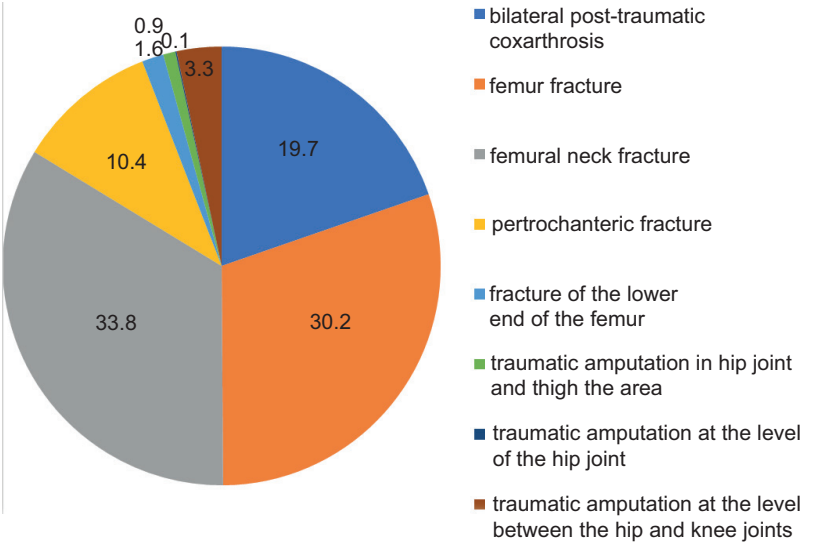

FIGURE 1. Long-term average annual structure of repeated disability due to hip joint injuries in Moscow for the 2013–2019 Period (%).

TABLE 6. Number of People Repeatedly Recognized as Disabled Due to Hip Joint Injuries among Adults Taking into Account Age Categories in Moscow for the 2013–2019 Period (Absolute Number, %, per 10 000, M ± m)

Year	Working age			Old working age		
	Absolute number	Share	Level	Absolute number	Share	Level
2013	42	24.1	0.06	132	75.9	0.45
2014	37	22.4	0.05	128	77.6	0.42
2015	27	20.1	0.04	107	79.9	0.53
2016	19	18.3	0.03	85	81.7	0.26
2017	22	27.2	0.03	59	72.8	0.18
2018	19	31.1	0.03	42	68.9	0.06
2019	28	54.9	0.04	23	45.1	0.07
Average value	28	25.5	0.04	82	74.5	0.28

The proportion of disabled people of group I in the structure of people repeatedly recognized as disabled due to hip joint injuries in Moscow decreased from 31.3% to 13.7%, averaging 27.3%, which is three times higher than the extensive indicator of group I disability caused by injuries of the lower limbs ($P < 0.05$). The number of the disabled people amounted to 207 people in total, averaging 30 people per year. The level of repeated disability of group I of such disabled people decreased from 0.05 to 0.01, averaging 0.03 per 10,000 of the adult population (See Table 7).

The analysis of the rate of repeated disability among the Moscow adult population caused by hip joint injuries taking into account disability severity and age categories revealed that the disabled people of group I accounted for 9.5% among people of the working age in 2013 with a subsequent decrease

TABLE 7. Dynamics of Repeated Disability Caused by Hip Joint Injuries among the Adult Population Taking into Consideration the Disability Severity for the 2013–2019 Period (Absolute Number, %, per 10 000)

Year	Disability group								
	I			II			III		
	Absolute number	Share	Level	Share	Absolute number	Level	Absolute number	Share	Level
2013	48	28.6	0.05	69	39.7	0.07	57	31.7	0.05
2014	47	28.5	0.05	58	35.2	0.05	50	30.3	0.05
2015	42	31.3	0.04	43	32.1	0.04	49	36.6	0.05
2016	27	26.0	0.03	36	34.6	0.03	41	39.4	0.04
2017	22	27.2	0.02	24	29.6	0.02	35	43.2	0.03
2018	14	22.9	0.01	17	27.9	0.02	30	49.2	0.03
2019	7	13.7	0.01	13	25.5	0.01	31	60.8	0.03
Average value	30	27.3	0.03	37	33.6	0.04	43	39.1	0.04

to 3.6%, averaging 6.7%, with a level equaled to 0.002 per 10,000 of the corresponding population. Among people above the working age, the proportion of the disabled people of group I varied from 43.0% to 26.1%, averaging 34.0%, which is higher than the share among people of the working age ($P < 0.05$). The level of repeated disability of group I among people of the working age decreased from 0.005 to 0.001, averaging 0.002. This level also decreased from 0.18 to 0.02 and averaged 0.09 per 10,000 of the corresponding population among people above the working age.

Among people of the working age, the share of the disabled people of group II tended to decrease from 54.8% to 17.8%, averaging 34.8%, and it amounted to 31.4% among people above the working age for the researched period (See Table 8). The level of repeated disability of group II among people of the working age ranged from 0.07 to 0.006 and averaged 0.01 with a tendency to decrease from 0.16 to 0.007, averaging 0.09 per 10,000 of the corresponding population, among people above the working age.

The share of the disabled people with group III was the highest among people of the working age: it increased from 35.7% to 78.6%, averaging 61.9% with a level of 0.02. The proportion of disabled people of group III among people above the working age ranged from 13.4% to 39.1%, averaging 32.4% with a level of 0.08 per 10,000 of the corresponding population.

CONCLUSION

For the researched period, the rate of primary disability caused by hip joint injuries among the adult population of Moscow was characterized by a downward trend. The level of primary disability averaged 0.09 ± 0.03 per 10,000 of the adult population. In the structure of disability caused by injuries of the lower limbs, injuries of the hip joint accounted for 10.5% over the studied period. In the age structure, the disabled people above the working age prevailed. During the observation period, their share decreased and averaged 81.5% with an average intensive rate of 0.24 with a downward trend. The nosological structure was dominated by people with disabilities caused by the femoral neck and femur fractures (46.2% and 29.3%, respectively). In the structure of those who were first recognized as disabled, the disabled people of GROUPS II–III groups prevailed (more than 40%) with a large share

TABLE 8. Structure of People Repeatedly Recognized as Disabled Due to Hip Joint Injuries Taking into Consideration the Disability Severity and Age Categories in Moscow for the 2013–2019 Period (Absolute Number, %, per 10 000)

Year	Age category	Disability group								
		I			II			III		
		Absolute number	Share	Level	Absolute number	Share	Level	Absolute number	Share	Level
2013	Of working age	4	9.5	0.005	23	54.8	0.03	15	35.7	0.02
	Above working age	44	33.3	0.15	46	34.8	0.16	42	31.9	0.14
2014	Of working age	2	5.4	0.003	15	40.5	0.02	20	54.1	0.03
	Above working age	55	43.0	0.18	43	33.6	0.14	30	23.4	0.10
2015	Of working age	3	17.5	0.004	11	40.7	0.01	13	41.8	0.02
	Above working age	39	36.4	0.12	32	29.9	0.10	36	33.7	0.12
2016	Of working age	1	5.3	0.001	6	31.6	0.008	12	63.1	0.02
	Above working age	26	30.6	0.08	30	35.3	0.09	29	34.1	0.09
2017	Of working age	—	—	—	3	13.6	0.004	19	86.4	0.03
	Above working age	22	37.3	0.07	21	35.6	0.07	16	27.1	0.05
2018	Of working age	1	5.3	0.001	4	21.1	0.006	14	73.6	0.02
	Above working age	13	31.0	0.04	13	31.0	0.04	16	38.0	0.05
2019	Of working age	1	3.6	0.001	5	17.8	0.007	22	78.6	0.03
	Above working age	6	26.1	0.02	8	34.8	0.02	9	39.1	0.03
Average value	Of working age	2	6.7	0.002	10	31.4	0.01	16	61.9	0.02
	Above working age	29	34.9	0.09	28	33.6	0.09	25	32.4	0.08

of the disabled people of group III and a small proportion of the disabled people of group II. The proportion of disabled people of group I is the smallest (averaged 19.6%), and it tended to decrease. In the structure of primary disability taking into account age categories and the disability severity, the disabled people of groups I–II and groups II–III predominated among people above the working age and people of the working age, respectively. The latter was characterized by a large proportion of patients of group III and a small per cent of people of group II.

The rate of repeated disability of this nature was also characterized by a downward trend. The level of repeated disability averaged 0.11 per 10,000 of the population. In the structure of repeated disability caused by injuries of the lower limbs, the share of people repeatedly recognized as disabled reached 8.5%. The structure was dominated by disabled people due to the femoral neck and femur fractures. Disabled people above the working age made up 74.5% with a level of 0.28 per 10,000 of the corresponding population. Over the studied period, we could observe the decreasing proportion of people of the working age. In terms of disability severity, the disabled people of group III (with the increasing share) and group II (with decreasing proportion) prevailed. The number of disabled people with group I decreased (their share was 27.3%).

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