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ФУНКЦИОНАЛЬНОЕ СОСТОЯНИЕ ЦЕНТРАЛЬНОЙ НЕРВНОЙ СИСТЕМЫ МЕДИЦИНСКОГО ПЕРСОНАЛА РОДОВСПОМОГАТЕЛЬНЫХ УЧРЕЖДЕНИЙ

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Цель. Анализ функциональных возможностей центральной нервной системы (ЦНС) медицинского персонала родовспомогательных учреждений в динамике рабочей смены.

Материалы и методы. При помощи методики САН изучено функциональное состояние ЦНС врачей (акушеров-гинекологов, неонатологов), среднего медицинского персонала (акушерок, медицинских сестер-анестезисток, палатных медицинских сестер) перинатальных центров и родильных домов городов Рязани, Смоленска, Липецка, Коломны в начале и в конце рабочей смены.

Результаты. Анализ показателей оперативной самооценки функционального состояния ЦНС (самочувствие, активность, настроение) выявил динамику снижения уровней самочувствия и активности основных профессиональных групп к концу рабочей смены. При подсчете индекса С+А/Н в динамике рабочей смены у врачей акушеров – гинекологов и неонатологов перинатальных центров установлено снижение на 5,0% (p=0,024174) и 10,6% (p=0,026637), соответственно; родильных домов – на 10,6% в обеих профессиональных группах (p=0,037452 и 0,039579). Среди сестринского персонала перинатальных центров выявлено снижение индекса у акушерок и медицинских сестер – анестезисток на 5,3% (p=0,000752) и 10,6% (p=0,000752), соответственно. В группах среднего медицинского персонала родильных домов снижение показателя определено у анестезисток, акушерок и палатных медицинских сестер на 16,7% (p=0,006566), 10,6% (p=0,003385) и 11,2% (p=0,001059), соответственно.

Заключение. Статистически значимые различия выявлены при анализе показателей самочувствия у неонатологов и акушерок перинатальных центров, у всех обследованных респондентов родильных домов; активности – у акушеров-гинекологов, неонатологов и акушерок перинатальных центров, у всех обследованных респондентов родильных домов; индекса С+А/Н – у акушеров-гинекологов, неонатологов, акушерок, анестезисток перинатальных центров и у всех обследованных профессиональных групп родильных домов. Ухудшение функционального состояния ЦНС к концу рабочей смены может указывать на развивающееся утомление.

Ключевые слова: *медицинский персонал; родовспомогательные учреждения; условия труда; центральная нервная система; ЦНС.*

FUNCTIONAL CONDITION OF THE CENTRAL NERVOUS SYSTEM OF MEDICAL PERSONNEL OF MATERNITY HOSPITALS

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Aim. Analysis of functional capacities of the central nervous system (CNS) of medical personnel of maternity hospitals in the dynamics of the work shift.

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Materials and Methods. Using the WAM method, the functional condition of the central nervous system of doctors (obstetricians, gynecologists, neonatologists), nurses (midwives, anesthesiologists, ward nurses) in perinatal centers and maternity hospitals in the cities of Ryazan, Smolensk, Lipetsk, and Kolomna at the beginning and end of the work shift was studied.

Results. Analysis of parameters of operational self-assessment of the functional state of the central nervous system (well-being, activity, mood) revealed the dynamics of reducing the levels of well-being and activity of the main professional groups by the end of the work shift. Calculation of the W+A/M index in the dynamics of the working shift showed its reduction in obstetricians-gynecologists and neonatologists of perinatal centers by 5.0% (p=0.024174) and 10.6% (p=0.026637), respectively; by 10.6% in maternity hospitals in both professional groups (p=0.037452 and 0.039579). Among the nursing staff of perinatal centers, the index decreased in midwives and nurses anesthesiologists by 5.3% (p=0.000752) and 10.6% (p=0.000752), respectively. In groups of nursing staff of maternity hospitals, decrease in the index was determined in anesthesiologists, midwives and ward nurses by 16.7% (p=0.006566), 10.6% (p=0.003385) and 11.2% (p=0.001059), respectively.

Conclusion. Statistically significant differences were found in the analysis of well-being parameters of neonatologists and midwives of perinatal centers, in all the studied respondents of maternity hospitals; of activity – in obstetrician-gynecologists, neonatologists and midwives of perinatal centers, in all surveyed respondents of maternity hospitals; of W+A/N index – in obstetrician-gynecologists, neonatologists, midwives, in anesthesiologists of perinatal centers and in all studied professional groups of maternity hospitals. Reduction of the functional condition of the central nervous system by the end of the work shift may indicate developing fatigue.

Keywords*: medical personnel; maternity facilities; working conditions; central nervous system; CNS.*

Monitoring of the functional condition and of adaptation capacities of an organism is a key component of prophylaxis of morbidity of medical personnel. Investigation of the functional condition of the central nervous system (CNS) which is the target and indicator of the influence of the working conditions in the dynamics of the work shift, permits to evaluate development of probable deviations and to work out a complex of measures for prevention of professional fatigue [1,2].

Aim – analysis of functional capacities of the CNS of medical personnel of obstetric institutions in the dynamics of work shift.

Materials and Methods

A perspective hygienic study was conducted where the objects of research were maternity hospitals: of Ryazan – Regional Clinical Perinatal Center, City Clinical Maternity Hospital № 1, Maternity Hospital of City Clinical Hospital №2; Maternity Hospital of City Clinical Hospital №10; of Smolensk – Perinatal Center; of Lipetsk – Lipetsk Regional Perinatal Center; of Kolomna – Kolomna Perinatal Center.

In the study two professional groups of doctors and three professional groups of nursing staff participated. The unit of observation were workers united into experimental cohorts by the method of master file: obstetricians-gynecologists ((n=53), of them 28 respondents were workers of perinatal centers (PC) and 25 – workers of maternity hospitals (MH)), neonatologists (n=28, of them 18 – workers of PC and 10 – of MH), midwifes, nurses-anesthesiologists, ward nurses (n=55, 36 and 56), respectively. Of them 28 workers of PC and 27 workers of MH made a professional group of midwifes, 18 and 18 made a professional group of nurses-anesthesiologists, and 32 and 24 – a group of ward nurses, respectively. In total, 228 workers were examined.

Operative study of parameters of the activity of the CNS was conducted by WAM method (well-being, activity, mood) developed in Sechenov First Medical University by V.A. Doskin, N.A. Lavrentyeva, V.B. Sharai and M.P. Miroshnikov. Self-evauation of parame-

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ters was carried out at the beginning and end of the work shift using conventional charts. The results were interpreted according to criteria recommended by the authors of the method [3].

WAM method also permits to evaluate the proportion of activity, well-being and mood, and each property separately. International Classification of Functioning, Disability and Health (ICF) adopted by World Health Organization (WHO) in 2011, determines activity as one of the main components for identification of disordered functions of viability. Investigation of activity by methods of psychophysiological testing helps correct the prognosis for adaptation to labor activity associated with neuropsychic loads. With the proper level of the functioning of the CNS, parameters of activity, mood and well-being are approximately equal. By the end of work shift the proportion between them changes toward reduction of well-being and activity in comparison with mood. [4,5].

Statistical analysis of the data base was performed using MS Excel 2010 with 'Analysis package' customization. Statistical reliability was evaluated using Student's t-test. The statistical significance level was $p<0.05$.

Results and Discussion

The analysis of the obtained results showed statistically significant reduction (by 5.5%, p=0.42660) of well-being in obstetricians-gynecologists of MH by the end of work shift (Table 1). A similar dynamics was exhibited by neonatologists: by 6.6% (p=0.030705) decline in the parameter in doctors of PC, and by 10.0% in doctors of MH. (p=0.005303).

In the group of nursing staff, in nurses-anesthesiologists of PC no statistically significant differences were found in self-evaluation of well-being in the dynamics of work shift, in the same professional group of MH this parameter decreased by 14.1% (p=0.004286). In the sample of midwifes working in PC, the well-being by the end of work shift decreased by 5.2% (p=0.041033), and in those working in MH – by 7.1% (p=0.009113). In ward nurses of PC no worsening of well-being in the dynamics of the work shift was found, in nurses of MH the well-being decreased by 7.7% (p=0.016667).

Table 1

Results of Self-Evaluation of Well-Being of Respondents by WAM Method

Professional Groups	PC		p	MH		p
	Beginning of work shift, M±m	End of work shift, M±m		Beginning of work shift, M±m	End of work shift, M±m	
Obstetricians-gynecologists	5.70±0.17	5.40±0.24	0.312624	5.50±0.12	5.20±0.08	0.042660
Neonatologists	6.10±0.07	5.70±0.16	0.030705	6.00±0.19	5.40±0.05	0.005303
Midwifes	5.80±0.13	5.50±0.06	0.041033	5.70±0.07	5.30±0.13	0.009113
Anesthesiologists	5.20±1.01	5.20±0.32	1.000000	5.70±0.14	4.90±0.22	0.004286
Ward nurses	5.30±1.01	5.30±0.72	1.000000	5.20±0.024	4.80±0.16	0.016667

Note: M – mean arithmetic of points in absolute numbers; m – mean error of mean arithmetic

Results of self-evaluation of activity showed statistically significant reduction of this parameter in professional groups of obstetricians-gynecologists of PC by 2.1% (p=0.015825), of MH – by 4.0% (p=0.032034), of neonatologists of PC and MH – by 11.0% (p=0.005127) and 10.8% (p=0.046436), respectively. In the groups of nursing staff of MH activity of nurses-anesthesiologists reduced by 13.8% (p=0.000448), of midwifes – by 9.0% (p=0.021521), of ward nurses – by 10.0% (0.001625, Table 2). In the group of midwifes of PC this parameter showed similar dynamics and reduced by 5.2% (p=0.021521).

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Table 2

Results of Self-Evaluation of Activity of Respondents by WAM Method

Professional Groups	PC		p	MH		p
	Beginning of work shift, M±m	End of work shift, M±m		Beginning of work shift, M±m	End of work shift, M±m	
Obstetricians-gynecologists	4.90±0.04	4.80±0.003	0.015825	5.50±0.11	5.20±0.08	0.032034
Neonatologists	6.10±0.07	5.70±0.11	0.005127	6.00±0.28	5.40±0.06	0.046436
Midwifes	5.80±0.12	5.50±0.08	0.042459	5.70±0.18	5.30±0.11	0.021521
Anesthesiologists	5.20±1.01	5.20±0.13	1.000000	5.70±0.14	4.90±0.15	0.000448
Ward nurses	5.30±1.00	5.30±0.02	1.000000	5.20±0.08	4.80±0.09	0.001625

Note: M – mean arithmetic of points in absolute numbers; m – mean error of mean arithmetic

In analysis of results of self-evaluation of the mood, no statistically significant differences in the change of this parameter in dynamics of the work shift were identified in respondents (Table 3).

Table 3

Results of Self-Evaluation of Mood of Respondents by WAM Method

Professional Groups	PC		p	MH		p
	Beginning of work shift, M±m	End of work shift, M±m		Beginning of work shift, M±m	End of work shift, M±m	
Obstetricians-gynecologists	5.70±1.15	5.60±1.08	0.949712	5.80±1.02	5.40±1.39	0.817480
Neonatologists	6.10±1.32	5.70±1.99	0.868320	5.90±0.17	5.90±0.04	0.000000
Midwifes	5.90±0.05	5.20±0.08	0.038798	5.90±1.26	5.80±1.14	0.953291
Anesthesiologists	5.50±0.02	5.80±0.99	0.000000	5.90±0.56	6.10±0.14	0.731182
Ward nurses	5.80±1.00	5.80±0.00	1.000000	5.60±0.02	5.60±0.07	1.000000

Note: M – mean arithmetic of points in absolute numbers; m – mean error of mean arithmetic

Thus, analysis of the results of the operative self-evaluation of functional condition of the CNS showed the dynamics of reduction of parameters of well-being and activity by the end of work shift in representatives of the above mentioned professional groups. This tendency persisted in calculation of 'well-being+activity/mood' (W+AM) index with the exception of the group of ward nurses (Table 4). In obstetricians-gynecologists and neonatologists of PC, the index decreased 5% (p=0,024174) and 10.6% (p=0.026637), respectively; in those of MH the index decreased 10.6% in both groups (p=0.037452 and 0.039579). Among nursing staff of PC, W+A/M index reduced in midwifes and nurses-anesthesiologists 5.3% (p=0.000752) and 10.6% (p=0.000752), respectively. In professional groups of the nursing staff of MH a similar dynamics was observed: in nurses-anesthesiologists, midwifes and ward nurses the index decreased by 16.7% (p=0.006566), 10.6% (p=0.003385), 11.2% (p=0.001059), respectively. The obtained results indicate a subjective sensation of buildup of fatigue by the end of work shift in the medical personnel of the mentioned professional groups [6].

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Table 4

W+A/N Index Levels in Professional Groups of Doctors and Nursing Staff

Professional Groups	PC		p	MH		p
	Beginning of work shift, M±m	End of work shift, M±m		Beginning of work shift, M±m	End of work shift, M±m	
Obstetricians-gynecologists	1,90±0,04	1,80±0,01	0,024174	1,90±0,09	1,70±0,02	0,037452
Neonatologists	1,90±0,03	1,80±0,03	0,026637	1,90±0,06	1,70±0,07	0,039579
Midwifes	1,90±0,03	1,80±0,03	0,036917	1,90±0,06	1,70±0,01	0,003385
Anesthesiologists	1,90±0,01	1,70±0,05	0,000752	1,80±0,08	1,50±0,07	0,006566
Ward nurses	1,70±0,05	1,70±0,02	1,000000	1,80±0,06	1,60±0,01	0,001059

Note: M – mean arithmetic of points in absolute numbers; m – mean error of mean arithmetic

Studies conducted earlier among schoolchildren of the 10th form and students of Chelyabinsk branch of Financial University under the Government of the RF, showed similar results, in particular, reduction of the parameters of well-being and activity, of W+A/M index in respondents by the end of the academic shift [7,8].

For prophylaxis of development of professional fatigue, sessions of mental self-regulation, autogenic training, electrotranquilization, respiratory exercises, listening to functional music, could be recommended. Such measures will permit optimization of the working load of professional groups of medical workers and will lead to subjective improvement of well-being and to maintenance of the activity throughout work shift [9,10].

Conclusion

Analysis of parameters of well-being (neonatologists and midwifes of perinatal centers and all examined groups in maternity hospitals) and of activity (obstetricians-gynecologists, neonatologists and midwifes of perinatal centers and all the examined groups in maternity hospitals) and also of W+A/M index in obstetricians-gynecologists, neonatologists, midwifes, anesthesiologists of perinatal centers and in all the examined professional groups of maternity hospitals showed statistically significant differences.

Dynamics of reduction of the functional condition of the central nervous system by the end of the work shift in respondents of most professional groups indicates development of fatigue, probably due to high tension of the working process.

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Дополнительная информация [Additional Info]

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