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PATENT DUCTUS ARTERIOSUS ASSOCIATION WITH THE CONGENITAL HEART DISEASE IN THE NEWBORNS OF THE REPUBLIC OF SAKHA (YAKUTIA)

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Long-term persistence of the ductus arteriosus is considered as a variant of pathology. Therefore, the identification of the most significant factors in the persistence of the ductus arteriosus is the basis for prevention. The aim of the study was to determine the factors associated with the persistence of the ductus arteriosus in newborns with congenital heart defects. This kind of study is performed for the first time in the Republic of Sakha (Yakutia). The article represents retrospective clinical study. The database included 1.824 cases of children with congenital heart defects. The most common association of the patent ductus arteriosus with congenital heart defects was found among the newborns with a gestation period of less than 32 weeks. It was determined that the prevalence of association of congenital heart disease with a patent arterial duct considerably increased depending on the severity of the heart failure.

Keywords: birth defects, heart, patent ductus arteriosus, children, Yakutia.

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Introduction. Congenital heart defects (CHDs) represent heterogenic groups of diseases, including comorbities, isolated and combined anomaly of multifactorial etiology. The problem of blood circulation defects is significant as it causes high mortality rate, especially during the first year of life, and disability afterwards. It is determined that CHDs are related to the disturbances of embryogenesis in the 2nd-8th week of gestation as result of genetic factors, environment and mother’s physical condition [3,5,7].

Long-term persistence of the ductus arteriosus is considered as a variant of pathology. However, the prevalence of patent (open) ductus arteriosus among the indigenous population of the North is still undetermined as there are no distinct criteria from what period of gestation the ductus arteriosus is considered to be a defect of development [1,3]. There are single publications of such kind concerning Caucasian population. It is hypothetically believed, that it should be closed during the first two weeks of life. Under such criteria, the prevalence of the isolated anomaly is 0.14-0.3 per 1000 live-born children, 7% among all CHDs and 3% among all the critical defects [6]. Persistence of the ductus arteriosus significantly depends on the term of pregnancy, besides that there are factors caused by mother, as intrauterine hypoxia, nonsteroidal anti-inflammatory drugs use and others [2,4]. The list of some other factors, which can be associated with the long-term persistence of the patent ductus arteriosus among the children with CHDs is not enough studied in the Republic of Sakha (Yakutia).

Objective The objective is to deter-

mine the association of the patent ductus arteriosus with CHDs in newborns of the Republic of Sakha (Yakutia) by the method of logit and regression analysis. This kind of investigation is performed for the first time in the Republic of Sakha (Yakutia).

Materials and methods: A retrospective clinical research work was performed on the base of the Perinatal centre of the Republican hospital No1, National centre of medicine. A research work is based on 1,824 clinical results of medical tests, taken from the medical records of the patients with a diagnosed "Congenital heart disease" (CHD). The time distance of the medical records is registered two times, thus from 2001 to 2003 and from 2013 to 2015. The CHD is recorded according to Q20-Q28 (ICD-10, chapter XVII: Congenital malformations, deformations and chromosomal abnormalities). The delivery case reports (#010u) and patient's discharge statistic card (#066/u-02) were the initial documentations for analysis.

All the newborns had experienced ultrasound examination (Doppler echocardiography) of the heart to evaluate the anatomical structure and cardiovascular function. The selection is based on the cases with bypass through interatrial septum according to the results of ultrasound investigation. The functioning activity of the arterial duct was evaluated by colour Doppler test to define additional flow in the vessel projection, i.e. pulmonary trunk. The research was performed from 2001 to 2003 on the base of ATL-HDI-3000 Philips, from 2013 to 2015 on the base of EPIQ-7 Philips.

Logit and regression analysis is performed to define the association of patent ductus arteriosus with CHD.

When $p<0.05$ the intergroup accuracy was considered significant. The initial data were accumulated in the database by means of Microsoft® Excel software, all the statistic operations were conducted by means of SPSS® Statistics software (IBM®, USA).

Results. The association of patent ductus arteriosus with CHD was revealed in 386 cases, 21.2%. No significant differences between gender association of patent ductus arteriosus was revealed, prevalence of patent ductus arteriosus was 21.8% in boys, and 20.4% ($p=0.436$) in girls.

Most commonly the association of patent ductus arteriosus with CHD was noticed in newborns with the period of gestation less than 32 weeks, rarely in groups of newborns with 32-37 weeks of gestation ($p<0.001$) (Table 1).

The association of patent ductus arteriosus with CHD differed not only by

Table 1

The distribution of patent ductus arteriosus cases in children with CHD according to the weeks of gestation

Gestation period	Absolute number of cases	Prevalence, %
Less than 32 weeks	78	30.3
32-37 weeks	119	16.4
38 weeks and more	189	22.6

Table 2

The prevalence of patent ductus arteriosus association with other CHDs

CHD case	Absolute number of cases	Prevalence
CHD without heart failure (HF): isolated interatrial septum defect, mild or in association with patent ductus arteriosus less than 0.2 cm.	73	7.2
CHD with HF of 1st class, NYHA classification 1: moderate interatrial septum defect or in association with patent ductus arteriosus less than 0.2 cm.	24	13.0
CHD with HF of 1st and 2nd class and more, NYHA classification of the 1st and 2nd class and more, NYHA classification 2 and more: non-complicated (simple) CHD + complicated (complex) CHD	289	46.0

Table 3

Association of patent ductus arteriosus with CHDs according to nosologies

CHD group	Absolute number of cases	Prevalence, %
Non-complicated (simple) CHDs	347	19.8
Complicated (complex) CHDs, including:	33	51.3
atrioventricular canal, complete	2	33.3
Anomalous pulmonary veins drainage, total	2	40.0
Pulmonary artery atresia Ebstein's anomaly,	5	71.4
tricuspid valve anomaly	3	50.0
Tricuspid valve atresia	0	0
Double-outlet right ventricle	2	50.0
Obstructive heart defects, coarctation of the aorta, interrupted aortic arch	1	100.0
Pulmonary artery stenosis	2	33.3
Transposition of great vessels	3	60.0
Fallot's tetrad	10	58.9
Abdominal aortic aneurysm	0	0
Complex CHD	3	60.0

Table 4

Factors associated with patent ductus arteriosus in newborns with CHD

Indicator	Corrected OS	95% DI for corrected OS	
Body weight	1.00	1.00	1.00
Sex: male female	 1.00 0.85	0.66	1.10
Gestation, weeks	0.89	0.84	0.95
CHD groups: group 1 group 2 group 3	 1.00 1.83 12.36	 1.11 9.12	 3.01 16.76
Complex CHD: no yes	 1.00 1.44	 0.89	 2.36

groups of defects depending on the presence / absence of impaired heart failure, but also nosological groups of defects. It is estimated that the prevalence of CHD association with patent ductus arteriosus considerably increased depending on the expression of the heart failure ($p<0.0001$), see tabe2.

Complicated (complex) CHDs more often were associated with patent ductus arteriosus (51.3% as against 19.8%, $p<0.0001$), see table 3.

According to the logit and regression analysis with the correction of the gestation, it was determined (see table 4) that CHD with heart failure of 1st degree (NYHA classification 1) moderate interatrial septum defect or in association with patent ductus arteriosus less than 0.2 cm and CHD with HF of 1st and 2nd class and more (NYHA classification of the 1st and 2nd class and more), NYHA classification 2 and more were significantly associated with patent ductus arteriosus. Moreover, there is no significant association of patent ductus arteriosus with complex congenital malformation.

Conclusion: According to the logit and regression analysis, the association of the patent ductus arteriosus with other CHDs is most common for newborns with the gestation period of less than 32 weeks. The association of CHD with the patent ductus arteriosus differed not only groups of defects depending on the prevalence of the heart failure, but also the nosologic groups of defects. The prevalence of CHD association with patent ductus arteriosus depending on the heart failure expression is revealed. The patent ductus arteriosus was also associated with complex heart defects.

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DIAGNOSTIC AND TREATMENT METHODS

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THE RISK STRATIFICATION OF THE VENOUS THROMBOEMBOLIC COMPLICATIONS IN ONCOCOLOPROCTOLOGY

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The article is devoted to the problem of the venous thromboembolic complications stratification in cases of the colorectal cancer. We performed prospective, randomized, blind study in colorectal surgery department. We analyzed the TEC risk factors due to up-to-date recommendations of the 100 consecutive patients with operable colorectal cancer. The doctors didn't know about the study (blind) to decrease the ability for study aggravation. After all, 100 cases were get numbers and randomized by the method of random number for 2 groups: Main group (n50) – the TEC stratification performed by our method; control group (n50) – the TEC level got from history of the patients.

The underestimation of the risk level of these complications was revealed. The reason of this risk underestimation was the absence of some risk factors evaluation connected with the patients' comorbidity and surgery. The authors of the article described method of the thromboembolism risk stratification by new soft for PC with ability to evaluate the risk objectively, unified and with mathematical accuracy with minimal effort.

It was found out the patients suffering from colorectal surgery has extremely high risk of the thromboembolic complications.

Keywords: colorectal cancer, thromboembolic complications, thromboembolism of the pulmonary artery, stratification.

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Introduction. The problem of the venous thromboembolic complications (VTEC) of the oncological surgical patients is still urgent. The risk of VTEC at this case is 10 till 40% without prophylaxis and fatal in about 10% cases [11]. The VTEC is situated on the second place in the structure of mortality and take place approximately in 20% [2]. The recent investigations has shown high risk of VTEC in cases of colorectal cancer [1, 3, 7].