6-MAY

2023

Toshkent tibbiyot akademiyasi

O‘zbekiston Respublikasi Sog‘liqni saqlash vazirligi

ZAMONAVIY PSIXOLOGIYA, PEDAGOGIKADA FAN, TA’LIM VA AMALIYOT INTEGRASIYASI: MUAMMO VA YECHIMLAR

Xalqaro ilmiy-amaliy konferensiyasi

Google Scholar indexed

CYBERLENINKA

Google scholar

ACADEMIC RESEARCH IN EDUCATIONAL SCIENCES

www.ares.uz

Toshkent tibbiyot akademiyasi

www.tma.uz

O‘zbekiston Respublikasi Sog‘liqni saqlash vazirligi

www.ssv.uz

MORPHOMETRIC INDICES OF LUNG TISSUE STRUCTURAL UNITS ACCORDING TO THE FORMS OF PRIMARY ATELECTASIS IN NEONATES

Zebo Ruzieva
Assistant of Department of Physicians the Tashkent Academy of Medicine, Tashkent, Uzbekistan
zebo.ruziyeva@mail.ru

ABSTRACT

This article, based on the analysis of scientific literature data, is devoted to morphometric indices of lung structural units in primary atelectasis in newborns. Qualitative indices of primary pulmonary atelectasis are assessed by color, size, degree of differentiation from the lung tissue, absence of air filling macroscopic and microscopic changes developed in the lungs. The most frequent form of respiratory impairment syndrome is atelectasis, the main causes of which are: lethargy and retardation of the respiratory center, underdevelopment of the respiratory system, hypoxia or asphyxia, trauma of the brain or spinal cord. Externally, the focus of atelectasis is fleshy, colorless, dark gray, microscopically the walls of the alveoli are stuck together, alveolocytes are displaced, cells and hyaline membranes are found in the cavity.

Keywords: child, lung, breathing, respiration, atelectasis, hyaginous membrane, surfactant, morphometry.

Резюме

Ушбу илмий адабиёт маълумотлари таҳлили бўйича тузилган мақола янги туғилган чақалоқларда бирламчи ателектаз формалари бўйича ўпка структур бирликларининг морфометрик кўрсаткичларига бағишланган. Ўпка бирламчи ателектазининг сифат кўрсатгичлари ўпкада ривожланган макроскопик ва микроскопик ўзгаришларнинг рангига, ўлчамларига, ўпка тўқимасидан фарқ қилиш даражасига, хаво билан тўлмаганлигига қараб баҳоланади. Нафас бузилиши синдромининг кўп учрайдиган формаси, бу ателектазлардир, унинг асосий сабаблари қуйидагилар: нафас марказининг сустлиги ва қўзғалишининг секинлашиши, респиратор тизим аъзоларининг чала ривожланганлиги, ўтказилган гипоксия ёки асфиксия, бош

ёки орқа миянинг шикастланиши. Ташқи кўринидан ателектаз ўчоғи гўштсимон, пучайган, тўқ кулрангли, микроскопик жиҳатдан альвеолалар девори бир-бири билан жипс жойлашган, альвеолоцитлар ўрнидан кўчган, бўшлиғида ҳужайралар, гиалин мембраналар учрайди.

Калит сўзлар: чақалоқ, ўпка, нафас, респирация, ателектаз, гиагин мембрана, сурфактант, морфометрия.

Резюме

Статья посвящена проблемам анализа данных научной литературы и единичных морфометрических параметров легочных структур при формах первичного ателектаза у новорожденных. Показатели качества первичного ателекта легкого оценивали по цвету макроскопических и микроскопических изменений, развившихся в легком, его внешнему виду, степени дифференциации от легочного выпота, отсутствию воздушного наполнения.

Наиболее частой формой астматического синдрома является ателектаз, основными причинами которого являются следующие: замедленность и замедление сокращений дыхательного центра, недоразвитие питания дыхательной системы, гипоксия или асфиксия, головная или грудная боль. Снаружи очаг ателектаза чешуйчатый, отечный, тонкий, микроскопически стенки альвеол склеены, альвеолоциты увеличены, в полости присутствуют клетки, гиалиновые оболочки.

Ключевые слова: толстый, тонкий, дыхание, дыхание, ателектаз, гиагиновая мембрана, сурфактант, морфометрия.

Qualitative indicators of primary pulmonary atelectasis are assessed by color, size, degree of differentiation from the lung tissue, absence of air filling macroscopic and microscopic changes developed in the lungs. According to patho- and morphogenetic signs of atelectasis development, 3 periods are distinguished: 1) mild - alveoli recession; 2) moderate severity - pulmonary blood circulation disorder caused by pulmonary edema; 3) pronounced atelectasis - lung coverage by secondary pathological tissue, i.e. pneumosclerosis, retention cyst of bronchi, bronchiectasis. Depending on the spread of the pathological process there are: whole lung atelectasis, segmental atelectasis, segmental, subsegmental atelectasis.

Congenital or primary atelectasis developed in the lungs of newborns, morphologically developed in both lungs, more often stillborn, they are small in size, wheezing when incised, sinking in water. Congenital atelectasis in children occurs more frequently in segments I, II, IX, X of both

lungs, and segments IV and V of the left lung, the cause of which depends on the level of differentiation of these segments. In the cavities of the bronchi and alveoli, the presence of sputum, mucus and blood is usually determined. The appearance of hyaline membranes on the inner surface of the alveoli is observed.

According to the international classification, depending on the significance of primary atelectasis for the body and taking into account its distribution, focal, total and subtotal atelectasis are distinguished: focal, total and subtotal atelectasis. Congenital and acquired atelectasis are distinguished according to their origin. The congenital form is observed with incomplete development of the lungs, blockage of the airways with mucus and sputum in premature infants. The mechanism for the development of congenital atelectasis is that, in fact, the fetus has lungs in a deflated state without air and waiting for the first breath.Sometimes normal children may physiologically develop atelectasis, but it soon opens up. Atelectasis is also classified according to its distribution: if it develops in a single acinar, it is called acinar atelectasis, in a piece - fragmentary, in a segmental - fragmentary, if in the whole lung tissue, it is called total atelectasis. . Sometimes atelectasis is observed in pleural effusion, anti-alvectatic factor deficiency, congenital pulmonary malformations, craniocerebral trauma, respiratory center depression.

1-table. Indicators of the area occupied by tissue structures according to the forms of atelectasis, M±m % and ABFK coefficient.

Groups	**Area occupied by structural units**, %				**ABFK**
	Vab	Vqt	Vqq	Vay	
N control	**49,7±2,23**	**16,1±1,64**	**3,8±0,85**	**30,4±2,08**	**1,63**
Acinar atelectasis	**21,6±1,84***	**23,8,1±1,90***	**14,7±1,58***	**39,9±2,18***	**0,54**
Segmental atelectasis	**14,3±1,56****	**21,8,1±1,71****	**9,7±1,32****	**54,2±2,22****	**0,26**
Lumpy atelectasis	**9,5±1,31*****	**23,4,1±1,89*****	**13,4±1,52*****	**53,7±2,21*****	**0,17**

next: * - R≤0.05 – reliability support to carry to the control group
** -R≤0.01 is a high reliability assistant to the control group
*** -R≤0.001 - high reliability assistant to the control group

Any pathological process, including primary pulmonary atelectasis, along with qualitative criteria of its characteristic morphological signs, reliability of the criteria of pathological changes evaluation will be higher if it is evaluated by its quantitative indices. To compare

the forms of primary pulmonary atelectasis according to quantitative indices, the lungs of the children who died from craniocerebral trauma without pulmonary pathology were taken as a control group. In the analysis of quantitative criteria, the area occupied by 4 structural structures was calculated: 1) alveolar space, 2) alveolar wall or foci of atelectasis, 3) blood vessels, and 4) foci of hemorrhage. In the control group, the air-filled alveolar space in the lung tissue occupied 49.7±2.23% of the area, indicating that the respiratory system of the lung tissue was not impaired. In contrast, alveolar space tissue was shown to occupy 30.4±2.08% of the space and there were no pathological changes in its structure. It was found that blood vessels included in alveoli, i.e. capillaries, in turn occupied 16,1±1,64% of the area, which corresponded to standard morphometric indices of lung tissue. At the same time the presence of hemorrhage foci, although they occupied a small area in the lung tissue, confirmed that they developed due to other types of pathological processes.

Acinar atelectasis, which is one of the forms of primary pulmonary atelectasis, is morphologically a small focal atelectasis. Because the smallest area of the lung tissue is an acinus, in which widespread pathological processes usually manifest as small foci. Morphometric study of acinic atelectasis showed that the area occupied by the respiratory alveolar space of the lung decreased more than 2 times in comparison with the control group, i.e. was 21.6±1.84* percent. In this form of atelectasis due to a sharp expansion of blood vessels in the lung tissue and their filling with blood, there was also a sharp expansion of the area they occupied, occupying 23.8.1±1.90*% of the volume. In addition, it was found that there appeared foci of hemorrhages and their occupied area was 14.7±1.58%. Areas of atelectasis lesions occupied a relatively large area, equal to 39.9±2.18%.

The segmental form of primary atelectasis has a larger focus than the acinar form and its morphometric study obtained the following data. In this form of atelectasis the alveolar space in the lung tissue is 3.5 times smaller than in the control group, 2 times smaller than in acinar atelectasis and occupies only 14.3±1.56% of the area. A sharp decrease in the area of air-filled space in the lungs is necessarily associated with the development of atelectasis, i.e., ballooning of the alveoli. In segmental atelectasis the area of atelectasis is increased up to 54.2±2.22%, which means that almost half of the lung tissue area is affected by atelectasis. In addition to these changes we detect dilation and fullness of vessels, and foci of hemorrhages occupy a certain area.

Among primary atelectasis, partial atelectasis is the most severe form both morphologically and functionally. In this form there is a complete involvement of the whole lung with atelectasis. It is found that the space of the alveoli receiving air in atelectasis is reduced to a minimal degree, occupying only 9.5±1.31% of the area. Oedema in this severe condition is certainly associated with the development of large and severe atelectasis, and morphometrically, the area of atelectasis is 53.7±2.21%, with almost half of the lung area affected. by atelectasis confirmed.

To confirm the results of this morphometric study from the functional point of view, we determine the coefficient of alveolar cavity area in relation to the area occupied by the alveolar wall or atelectasis areas - the alveolar cavity activity factor (ABFC). This coefficient indicates the level of air filling or breathing of the alveoli in the lung tissue. Calculations showed that in the control group this coefficient was 1.63. In acinar atelectasis this coefficient decreased 3.5 times in comparison with the control group and was 0.54. In segmental atelectasis which was a more severe form of primary atelectasis the ACFC was found to be worse, it decreased 6.5 times in comparison with the control group and was only 0.26. In lobular atelectasis, which is the most severe form of primary atelectasis, the lung respiratory rate was found to be almost 0, it decreased 10-fold compared to the control group, being only 0.17.

Conclusion

From the morphometric point of view, it was confirmed that the area of alveolar cavity, indicating the level of air filling of the lung tissue or the level of breathing, is half of the total area of the lung tissue, and 3/1 of the area of the alveolar wall.

By forms of primary atelectasis, alveolar space is sharply reduced, the occupied area decreases 2.4 times in acinar atelectasis, 3.6 times in segmental atelectasis and 5.3 times in lobular atelectasis; conversely, atelectasis area increases.

The alveolar cavity activity coefficient was confirmed to reflect the level of breathing in the lung tissue and was 1.63 times in the control group, 3.5 times in acinar atelectasis, 6.5 times in segmental atelectasis and 10 times in lobular atelectasis.

REFERENCES

1. Banks E. Lungs of newborns / edited by R. Paulin; transl. English ed. by D.Yu. Ovsyannikov. M., 2015. 672 c.
2. Natalia Alexandrovna Belousova. Morphological characteristics of lungs and fetuses of newborns with extremely

low body weight in respiratory distress syndrome : dissertation ... D. : 14.00.15 / Natalia Alexandrovna Belousova; GOUVVPO "Military Medical Academy. - SPb, 2006. - 120 c.

3. Wauer R. Surfactant and neonatology. Prevention and Treatment of Respiratory Distress Syndrome in Newborns. M., 2011. 96 c.
4. Ruzieva, Z. I. (2022). PATHOMORPHOLOGY OF PRIMARY ATELECTASIS OF THE LUNGS OF INFANTS. 湖南大学学报 (自然科学版), 49(02).
5. Ruzieva, Z. I. (2022). Risk factors for primary atelectasis in newborns.
6. Ruzieva, Z. I. (2022). Histopathology in Primary Atelectasis in Infants and Risk Factors.
7. Исраилов, Р., Рузиева, З. И., & Мирзабекова, О. А. (2020). EMBRIOGENESIS, ONTOGENESIS AND HISTOPOGRAPHY OF MEMBERS OF THE RESPIRATORY SYSTEM. Новый день в медицине, (2), 118-122.
8. Нарметова, Ю. (2016). Вопросы организации психологической службы в перинатологии и родовспоможении. Фан ва жамият.
9. Нарметова, Ю. (2016). Психодиагностические аспекты перинатальной психологии. Диагностика в медицинской (клинической) психологии: традиции и перспективы (к 105-летию СЯ Рубинштейн).
10. Karimovna, N. Y. (2022). AUTISM AND THE IMPORTANCE OF COMMUNICATION WITH PATIENTS OF THIS DISEASE. Gospodarka i Innowacje., 23, 8-10.
11. Нарметова, Ю. (2014). Депрессия-психосоматик касалликларнинг предиктори сифатида. Scienceweb academic papers collection.
12. Melibaeva, R. (2021). Bolalardagi giperfaollik va diqqat tanqisligi sindromi: sabablari, psixologik tashxisi.
13. Мелибаева, Р. Н. (2018). Проблема умственного развития в трудах психологов советского периода. In International scientific review of the problems and prospects of modern science and education (pp. 127-129).
14. Nasirovna, M. R. (2022). THE ROLE OF PSYCHOLOGICAL DIAGNOSIS IN CLINICAL PRACTICE. Conferencea, 4-6.
15. Мелибаева, Р. (2018). ТАЛАБАЛАР ТАФАККУРИНИ РИВОЖЛАНТИРИШНИНГ ПСИХОЛОГИК МЕХАНИЗМЛАРИ.