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CHRONIC BRONCHITIS FROM THE ACTION OF FLAX DUST

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Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere. When written as ё in Russian, transliterate as yё or ё. The use of diacritical marks is preferred, but such marks may be omitted when expediency dictates.

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RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English
sin	sin
cos	cos
tg	tan
ctg	cot
sec	sec
cosec	csc
sh	sinh
ch	cosh
th	tanh
cth	coth
sch	sech
csch	csch
arc sin	$\sin^{-1}$
arc cos	$\cos^{-1}$
arc tg	$\tan^{-1}$
arc ctg	$\cot^{-1}$
arc sec	$\sec^{-1}$
arc cosec	$\csc^{-1}$
arc sh	$\sinh^{-1}$
arc ch	$\cosh^{-1}$
arc th	$\tanh^{-1}$
arc cth	$\coth^{-1}$
arc sch	sech^{-1}
arc csch	csch^{-1}
rot	curl
lg	log

GREEK ALPHABET

Alpha	A	α		Nu	N	ν	
Beta	B	β		Xi	Ξ	ξ	
Gamma	Γ	γ		Omicron	O	o	
Delta	Δ	δ		Pi	Π	π	
Epsilon	E	ε		Rho	P	ρ	
Zeta	Z	ζ		Sigma	Σ	σ	ς
Eta	H	η		Tau	T	τ	
Theta	Θ	θ		Upsilon	T	υ	
Iota	I	ι		Phi	Φ	φ	ϕ
Kappa	K	κ		Chi	X	χ	
Lambda	Λ	λ		Psi	Ψ	ψ	
Mu	M	μ		Omega	Ω	ω	

CHRONIC BRONCHITIS FROM THE ACTION OF FLAX DUST

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The action of flax dust on the respiratory organs causes lowering of the sense of smell, the development of subatrophic and atrophic catarrhs of the nose and nasopharynx (R. B. Pinus, 1930; M. G. Novikov, 1960; A. V. Sokolov, 1962; Ye. D. Bakalinskaya, N. P. Savenko, 1962; V. P. Malen'kiy, 1966; Ye. A. Krechkovskiy, 1967; V. P. Malen'kiy, 1968) showed in an experiment on animals that flax dust also causes phlogistic-desquamative bronchitis.

In this work materials are presented which characterize the frequency of chronic bronchitis of workers depending on length of industrial service and sensitizations of the healthy and of patients with chronic bronchitis to flax dust.

Two hundred and twenty-nine people (219 women and 10 males) from weaving and spinning mills of the flax industry are examined.

Along with general therapeutic examination, acetylcholine inhalation tests were conducted on 213 workers with 0.1% and 1% solutions of acetylcholine. Duration of inhalation 1-2 minutes. As is known, inhalations of 0.1% solution of acetylcholine by essentially healthy persons cause no reactions, whereas with the diseases of the bronchi they are accompanied by a coughing reaction and lowering in the breathing volumes, which indicates a change in the excitability of the receptor apparatus of the broncho-pulmonary system (with diseases of the upper respiratory tracts more frequently only a coughing reaction is observed). Before and after the test the pneumotachometric indicators were measured - the power of expiration and inhalation. When a coughing reaction and bronchospasm appeared after inhalation of a 0.1% solution of acetylcholine the test with the 1% solution was not conducted. Inhalation tests with acetylcholine were not conducted on worker in the presence of bronchial asthma, or pathology of the cardiovascular system or gastro-intestinal tract.

The sensitization of workers to flax dust was studied by carrying out scarification allergy tests with an allergen, prepared from flax dust and flax fiber according to the procedure, described in the book "Practical Allergology" edited by A. D. Ado and A. A. Pol'ner. Flax dust and the ground flax fiber, poured in jars with the extracting liquid of Kona, were shaken on a rocker for 8 days. Then the mixture was filtered through Seitz's gauze, paper and sterile filters. After a check for sterility, the filtrate was placed in ampules and was ready for use. One-two drops allergena with a content of amino nitrogen of 21 mg/l were applied to the cleansed skin and were rubbed in on the spot of the scarifications, made with a scarification needle in the form of three cuts to 1 cm. The test was considered positive with appearance hyperemia and papules more than 1 cm.

Of 229 inspected persons, 42 complained of periodic dry cough, which was explained by the presence of periodically recurring

rhinites, pharyngites, and catarrhs of the upper respiratory tracts; in 37 people the cough was accompanied by the secretion of mucus in the morning, and toward the end of the working shift, over a period of from one to two and more years, which made it possible to speak about chronic bronchitis. During auscultation, they were heard to have individual dry, whistling scattered or moist wheezes.

Chronic bronchitis was characterized by gradual development, with comparatively benign course and with the secretion of a small quantity of mucus; in 11 people chronic bronchitis was preceded or accompanied by bronchial asthma which developed gradually and was characterized initially by the sensation of shortness of breath after work, more frequently toward the end of the work week.

The frequency of development of chronic bronchitis depending on age and length of industrial service is represented in Table 1.

Table 1

Contingent of those examined	Age			Length of industrial service		
	to 30 yrs	31-40 yrs	over 40 yrs	to 10 yrs	11-20 yrs	over 20 yrs
Total of examined workers	26	133	70	35	145	49
Chronic bronchitis revealed in %	–	14.3±3	25.7±5.2	5.7±3.3	12.1±2.6	34.6±6.8

Among workers, age 31-40 years it is revealed that 19 have chronic bronchitis (14.3±3%), over 40 years - 18 (25.7±5.2%). During statistical interpretation the difference in the indicated age groups is substantial (t=4).

Among workers with length of industrial service to 10 years, 2 cases of chronic bronchitis are revealed (5.7±3.3%), from 11 to 20 years - 18 (12.1±2.6%), more than 20 years - 17 (34.6±6.8%). The difference in these groups was statistically somewhat higher (t=2.5 and 7), which indicated the important role also of industrial factors in the formation of chronic bronchitis.

Of those with chronic bronchitis the functional indicators of external respiration decreased more significantly as compared with healthy persons in the same age groups (difference statistically substantial with t=2.5-3) (Table 2).

Table 2

Age	Groups	Number of persons examined	Indicators of external respiration		
			JEL* in ml	the power of expiration in ml/s	power of inspiration in ml/s
To 30 yrs	healthy	14	3360±130	4550±190	3800±100
31-40 yrs	healthy	77	3260±50	4430±107	3800±75
	chronic bronchitis	19	3080±43	3700±22	3600±15
Over 40 yrs	healthy	52	3100±140	3670±120	3500±90
	chronic bronchitis	18	2870±60	3260±270	3400±110

*JEL = VITAL CAPACITY.

While conducting a test with 0.1% and 1% solutions of acetylcholine on persons with chronic bronchitis, as a rule, there appeared a coughing reaction and lowering in the functional indicators of external respiration was observed. The decrease in the power of expiration after the test was 338±80 ml/s, whereas among healthy persons the pneumotachometric indicators were not changed. This indicated an increase in the sensitivity of the receptor apparatus of the broncho-pulmonary system to external irritants.

For the development of sensitization of 91 workers (among them were 25 with chronic bronchitis) and of 30 persons of a control

group having no contact with flax dust, scarification tests were conducted with an allergen. Rapid (after 30-50 min) and retarded allergic reactions (in 24 hours) were taken into account. In the control group, allergic reactions to the introduction of the allergen were not observed. Among 18 of 66 (27±5.5%) workers with a great length of service and without pulmonary pathology, the rapid type allergic reaction was noted on the spot of scarification (the size of the papule varied from 1 to 2 cm in diameter). Among 14 of the 25 persons (56±10.1%) with chronic bronchitis a similar allergic reaction was also observed. Retarded type allergic reactions were negative in control and experimental groups.

With the aid of allergy tests the presence of sensitization of the senior workers and those with chronic bronchitis was revealed, whereby among the latter an increase in sensitivity to the allergen of flax dust was encountered more frequently as compared with healthy persons (difference is statistically reliable with t=7).

Thus, in the development of chronic bronchitis several factors are important: the long-term action of industrial dust, the sensitization of the organism, and age. Considering that chronic bronchitis - by no means an inoffensive disease - contributes to the significant lowering of functional indicators of external respiration of those affected, it is necessary to pay great attention to the latter. Those persons with chronic bronchitis without breathing deficiency need the timely conducting of inhalation therapy, sanitorium and spa treatment, and in the case of expressed breathing deficiency - rational job placement in addition.

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