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STUDIES IN BRONCHIAL ASTHMA

II.

A Comparative Examination Between Patients with Endogenous and Exogenous Bronchial Asthma respectively, with Regard to Age when taken Ill

By

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In the now extensive literature concerned with bronchial asthma, much data regarding the age when taken ill are to be found. However these are very often short and summary.

Vaughan and Black (1955) state that the general opinion is that asthma in 29 to 41 % of cases makes its first appearance during the first ten years of life, and that probably 75 % indicate it before the age of 35. After 60 years of age it is very seldom that anyone gets asthma. *Tuft* (1937), *Criep* (1945), *Urbach* (1946), *Feinberg* (1946) and *Hansel* (1952) have given similar data. *Sonne* (1941) has found that asthma seldom begins after 40 years of age, but is not unusual in children. *Peipers* (1930) found that of 479 patients 45.6 % became ill between 20 and 40 years of age.

Walker (1917), *Cooke* (1945), *Abderhalden* (1950), *Rackemann* (1951) found that with the type of asthma where one can find specific allergens as the agent, the onset of the complaint usually occurs before 30 years of age. The latter considers that more than 75 % of all asthma belongs in this category.

Bray (1934) examined the age of onset in 4317 asthma patients. 33.7 % became ill before 10 years of age and 81.6 % before 40 years of age.

According to *Salter* (1882) asthma starts before 10 years of age in 31.6 %, according to *Berkart* (1889) in 35 %, and according to *Adam* (1917) in 30 % of cases.

According to *Balyeat* (1928) the symptoms first appear during the first 10 years of life in 32.3 % of cases in unilateral and in 58.6 % in bilateral inheritance to allergic illnesses. His material includes both hay-fever and asthma.

Gram (1931), among other things, investigated the age of onset in 613 patients with asthma and came to the conclusion that asthma can appear at any age. Only in 12.7 % asthma started during the first 10 years of age.

Norgaard (1938) carried out a similar investigation on 200 badly affected patients; the results of this are tabulated below:

Age of onset	Males	Females	Total	%
0-9	40	23	63	31.5
10-19	29	13	42	21.0
20-29	23	8	31	15.5
30-39	15	21	36	18.0
40-49	8	10	18	9.0
50-59	3	7	10	5.0
	118	82	200	100

Claussen (1948) who among other things investigated the onset of asthma in 1568 patients found that it often starts in childhood, but that it attained a second maximum at about the age of 35. In 41 % of the men asthma started after 30 years of age and in 24 % after 40 years of age. Corresponding figures for women were 47 % and 26 % respectively.

Unger (1943), as has been mentioned before, divided his cases into paroxysmal and chronic asthma according to the clinical course. Among 298 cases with paroxysmal asthma the symptoms first appeared in 188 (63 %) before the age

of 20, among 161 cases with chronic asthma in 66 (40 %) before that age.

In the publications referred to so far, only the age of onset has been mentioned, while nothing has been said about the age classification of the patients.

Cooke and Vander Veer (1916) made an investigation with that thought in mind. They examined the age of onset in 623 patients with hay-fever and asthma of the "extrinsic" type. Of these 135 men and 101 women had asthma. Of the asthma patients 117 (49.6 %) had been taken ill before 18 years of age. However 18 of these were younger than 18 and 39 younger than 25 on the occasion of examination. 135 patients were more than 35 years old. Of these only 44 (30.4 %) had become ill before 18 years of age and of the 62 patients more than 45 years old, only 13 (20.9 %) had become ill before 18 years. The authors were also able to show that the onset occurred considerably earlier in cases with inheritance to allergic diseases as compared with cases without inheritance.

Spain and Cooke (1924) obtained similar results with 116 men and 92 women with asthma. 98 (47.1 %) actually were attacked before 18 years of age but of these 60 were under 18 years of age on the occasion of the examination. 88 (42.3 %) were over 35 years of age, and of these only 16 (7.6 %) had fallen ill before 18 years of age.

Rackemann (1927) carried out an investigation of 425 cases of extrinsic and 499 cases of intrinsic asthma. He found that with extrinsic asthma the onset occurred at an earlier age than with intrinsic asthma. In the former cases, the first symptoms appeared before 10 years of age, in 39.4 %, and before 30 years of age in 78.8 %, in the latter cases in 25.7 % and 52.9 % respectively. Different ages were well-represented.

Baagöe (1931) found that asthma made its first appearance before 5 years of age in 120 (77.4 %) of 155 asthmatic cases in the age group 1 to 15 years. In another group consisting of 138 asthmatics over the age of 20 the result, however, was that only 27 (19.6 %) had been taken ill before 10 years of age but 55 (39.9 %) after 30 years of age.

Rhode (1937) obtained similar results with 136 men and 91 women in the age group 10 to 60 years, and *Harvey et al.* (1929) with 193 men and 167 women.

Rosen (1946) examined the age onset in 100 soldiers with asthma aged 18 to 39. Of these 53 (53.0 %) had become ill before 18 years, and 47 (47.0 %) after 18 years of age. The majority, however, were young people, the average age being 26 years.

The last investigations referred to show that the usual opinion that asthma is a complaint which usually makes its first appearance in childhood is not right. It very frequently commences in adulthood. In order to be able to estimate the age of onset correctly, it is, however, necessary to know the different ages of the patients at the time of examination. The data which show that in the majority of cases the first attack begins at an early age, most certainly emanate from investigations on children.

THE AUTHOR'S INVESTIGATIONS

Introduction.

In order to be able to estimate the age of onset it is important to account for the symptoms of the complaint which are considered to be signs of incipient asthma. As far as the present author could find only *Baagöe* has touched on this question. As he has very rightly pointed out, asthma patients have very often had frequently recurring bronchitis for a longer or shorter period before the typical asthmatic distress commenced. *Baagöe* reckoned the start of asthma from the time when these bronchial symptoms first appeared, partly because the patient in his opinion could frequently give fairly exact information concerning the time when the bronchitis started, partly because he considered bronchitis to be of asthmatic nature in these patients.

In the great majority of cases relating to the present investigation, there has been no difficulty in deciding when the

asthma made its first appearance. The patient has usually been able to state a definite year.

In the present author's opinion, which is also that of the patients as found in records and questionnaires the asthma started at the time when distress in the form of difficulty in breathing, wheezing, and constriction of the chest commenced. On the other hand bronchitis which has not involved such distress and which has been cured and later given no distress to the patient has not been considered to be the start of asthma. The patients themselves have been able to notice the difference between such normal bronchitis and asthmatic distress. If the patients, however, have had very lengthy or continuously recurrent bronchitis with wheezing breathing, this has been considered as the onset of asthma.

Ages of onset have been divided into different periods in the following way: The first includes ages under 18, the next those between 18 and 24, after which the classification has been made in 10-years periods up to the age of 65. All those of 65 and over have been put into one group.

Apart from the age of onset, the age of the patients at the examination has also been included. The division of these has been made with the same time intervals as the age of onset, except that the age group under 18 years has not been included as all the patients were at least 18 years old. The arrangement of the following tables is otherwise obvious.

The material has been further divided so that the hospitalized patients and the out-patients have been accounted for in different tables.

The present investigations includes 748 patients, namely 400 hospitalized and 348 out-patients, all at least 18 years old. With the help of anamnesis, skin tests, and provocation tests the author has shown above that 133 patients (17.9 %) had the type of asthma where allergens of different kinds could be proven to be the cause of the asthma, while in the remaining 615 cases this agent was not discoverable. In this work the first group is entitled *exogenous*, and the latter group *endogenous* asthma. See further Chapter I.

RESULTS OF AUTHOR'S INVESTIGATIONS

Hospitalized Patients (tables 10 to 11).

These include 400 patients, namely 148 men and 252 women. Of these 37 men and 28 women had exogenous asthma while 111 men and 224 women had endogenous asthma.

TABLE 10 A
Age at Onset of Asthma in Relation to Age when Examined.
Hospitalized Males with Endogenous Asthma.

Patient's age at time of examination	Number of patients	Age of onset						
		< 18	18-24	25-34	35-44	45-54	55-64	≥ 65
18-24	1	1						
25-34	8	5		3				
35-44	19	6	1	4	8			
45-54	34	4	1	5	13	11		
55-64	34				5	14	15	
≥ 65	15	1			2	1	5	6
Total	111	17	2	12	28	26	20	6

TABLE 10 B
Age at Onset of Asthma in Relation to Age when Examined.
Hospitalized Females with Endogenous Asthma.

Patient's age at time of examination	Number of patients	Age of onset						
		< 18	18-24	25-34	35-44	45-54	55-64	≥ 65
18-24	7	5	2					
25-34	23	9	6	8				
35-44	43	5	11	14	12	1		
45-54	62	3	3	11	19	25	1	
55-64	56	1	4	6	16	19	10	
≥ 65	33	3		1	5	13	8	3
Total	224	26	26	40	52	58	19	3

Endogenous Asthma (tables 10 A-10 B).

Of the 111 men with endogenous asthma, only 1 (0.9 %) was between 18 and 24 years of age on the occasion of the

examination, 8 between 25 and 34 years of age, 19 between 35 and 44, 34 between 45 and 54, 34 between 55 and 64, and 15 at least 65 years old. The majority of the men, 87 (78.3 %), were between 35 and 65 years of age. Of all the 111 men, only 17 (15.4 %) had been attacked before 18 years of age, that is to say, in childhood or adolescence, 2 (1.8 %) between 18 and 24, 12 (10.8 %) between 25 and 34, 28 (25.2 %) between 35 and 44, 26 (23.4 %) between 45 and 54, 20 (18.0 %) between 55 and 64, and 6 (5.4 %) 65 years old and above.

Of the 224 women with endogenous asthma only 7 (3.1 %) were between 18 and 24 years on the occasion of the examination, 23 between 25 and 34, 43 between 35 and 44, 62 between 45 and 54, 56 between 55 and 64, and 33 at least 65 years old. The majority, 161 (71.8 %), were therefore between 35 and 65 years of age. Concerning the ages of onset it is found that just as amongst the men only a minority were attacked before 18 years of age, namely 26 (11.6 %) patients, 26 (11.6 %) between 18 and 24, 40 (17.9 %) between 25 and 34, 52 (23.2 %) between 35 and 44, 58 (25.9 %) between 45 and 54, 19 (8.5 %) between 55 and 64, and 3 (1.3 %) at least 65 years old.

Exogenous Asthma (tables 11 A-11 B).

Of the 37 men with exogenous asthma not less than 11 (29.7 %) were between 18 and 24 years of age on the occasion of the examination, 12 between 25 and 34 and 9 between 35 and 44 years. Only 5 were therefore more than 45 years old.

The age of onset in these 37 patients was considerably lower than in the endogenous cases. 23 (62.2 %) had been attacked for the first time before 18 years of age, 3 (8.1 %) between 18 and 24, 6 (16.2 %) between 25 and 35, 3 (8.1 %) between 35 and 44, and 2 (5.4 %) between 45 and 54 years.

The data for the 28 women with exogenous asthma were

TABLE 11 A
Age at Onset of Asthma in Relation to Age when Examined.
Hospitalized Males with Exogenous Asthma.

Patient's age at time of examination	Number of patients	Age of onset						
		< 18	18-24	25-34	35-44	45-54	55-64	≥ 65
18-24	11	10	1					
25-34	12	9		3				
35-44	9	3	2	2	2			
45-54	2				1	1		
55-64	3	1		1		1		
≥ 65								
Total	37	23	3	6	3	2		

TABLE 11 B
Age at Onset of Asthma in Relation to Age when Examined.
Hospitalized Females with Exogenous Asthma.

Patient's age at time of examination	Number of patients	Age of onset						
		< 18	18-24	25-34	35-44	45-54	55-64	≥ 65
18-24	6	5	1					
25-34	8	6	1	1				
35-44	11	1	1	6	3			
45-54	2			1	1			
55-64								
≥ 65								
Total	27	12	3	8	4			

analogous to those of the men. (Information is missing in the case of 1 deceased patient, for which reason the accounted number is 27.) 6 (22.2 %) of the patients were between 18 and 24 at the time of the examination, 8 between 25 and 34, 11 between 35 and 44, and 2 between 45 and 54 years of age. No one was over 55.

The ages of onset were also relatively low. 12 (44.5 %) had had the first asthma symptoms before 18 years of age, 3 (11.1 %) between 18 and 24, 8 (29.6 %) between 25 and 34, and 4 (14.8 %) between 35 and 44 years. After this age no one had been attacked.

Out-Patients (tables 12 to 13).

As in the case of the hospitalized patients, these are divided into exogenous and endogenous cases. They include, as mentioned above 348 cases, of which 140 were men and 208 women. Of these, 38 men and 30 women had exogenous asthma, while 102 men and 178 women had endogenous asthma.

Endogenous Asthma (tables 12 A-12 B).

TABLE 12 A
Age at Onset of Asthma in Relation to Age when Examined.
Male Outpatients with Endogenous Asthma.

Patient's age at time of examination	Number of patients	Age of onset						
		< 18	18-24	25-34	35-44	45-54	55-64	≥ 65
18-24	2	2						
25-34	12	4	1	7				
35-44	15	3	1	7	4			
45-54	24	1		6	7	10		
55-64	23	1	1	1	7	5	8	
≥ 65	18				2	1	11	4
Total	94	11	3	21	20	16	19	4

TABLE 12 B
Age at Onset of Asthma in Relation to Age when Examined.
Female Outpatients with Endogenous Asthma.

Patient's age at time of examination	Number of patients	Age of onset						
		< 18	18-24	25-34	35-44	45-54	55-64	≥ 65
18-24	4	1	3					
25-34	24	7	10	7				
35-44	50	10	7	17	16			
45-54	50	3	1	13	21	12		
55-64	24	2		6	4	7	5	
≥ 65	10	2				3	4	1
Total	162	25	21	43	41	22	9	1

Of the 102 men with endogenous asthma the data were so incomplete in 8 cases, and of the 178 women in 16 cases, that it was not possible to draw any conclusions concerning the age of onset; of the 94 remaining men with endogenous asthma only 2 (2.1 %) were between 18 and 24 years when examined, 12 between 25 and 34, 15 between 35 and 44, 24 between 45 and 54, 23 between 55 and 64, and 18 at least 65 years old. The ages of onset in these patients agreed for the most part with those of the hospitalized patients. Only 11 (11.7 %) had been attacked before 18 years, 3 (3.2 %) between 18 and 24, 21 (22.3 %) between 25 and 34, 20 (21.3 %) between 35 and 44, 16 (17.0 %) between 45 and 54, 19 (20.2 %) between 55 and 64, and 4 (4.3 %) at least 65 years.

Of the 162 women with endogenous asthma only 4 (2.5 %) were between 18 and 24 years at the time of the examination, 24 between 25 and 34, 50 between 35 and 44, 50 between 45 and 54, 24 between 55 and 64, and 10 at least 65 years. Only 25 (15.4 %) of these had been attacked for the first time before 18 years of age, 20 (12.3 %) between 18 and 24, 43 (26.6 %) between 25 and 34, 41 (25.3 %) between 35 and 44, 22 (13.6 %) between 45 and 54, 9 (5.6 %) between 55 and 64, and 2 (1.2 %) at least 65 years.

Exogenous Asthma (tables 13 A-13 B).

Among the 38 men with exogenous asthma the data were incomplete in 4 cases. In the remaining 34 one finds as in the case of the hospitalized patients considerably lower ages than in the endogenous cases. 10 (29.4 %) patients were 18 to 24 years old on the occasion of the examination, 11 between 25 and 34, 9 between 35 and 44, and 4 between 45 and 54 years old.

On the whole, the age of onset was also lower. Not less than 19 (55.9 %) subjects had been attacked before 18 years, 3 (8.8 %) between 18 and 24, 5 (14.7 %) between 25 and 34, 7 (20.6 %) between 35 and 44. There was no case of

TABLE 13 A

*Age at Onset of Asthma in Relation to Age when Examined.
Male Outpatients with Exogenous Asthma.*

Patient's age at time of examination	Number of patients	Age at onset						
		< 18	18-24	25-34	35-44	45-54	55-64	≥ 65
18-24	10	9	1					
25-34	11	5	2	4				
35-44	9	3		1	5			
45-54	4	2			2			
55-64								
≥ 65								
Total	34	19	3	5	7			

TABLE 13 B

*Age at Onset of Asthma in Relation to Age when Examined.
Female Outpatients with Exogenous Asthma.*

Patient's age at time of examination	Number of patients	Age at onset						
		< 18	18-24	25-34	35-44	45-54	55-64	≥ 65
18-24	7	3	4					
25-34	6	3	2	1				
35-44	7	1	2	3	1			
45-54	7	1		3	2	1		
55-64								
≥ 65								
Total	27	8	8	7	3	1		

asthma making its first appearance after the age of 45.

Of the 30 women with exogenous asthma the age of onset could not be decided in 3 cases. Of the 27 remaining cases 7 (25.9 %) were between 18 and 24 years, 6 between 25 and 34, 7 between 35 and 44, and 7 between 45 and 54. Of these the symptoms first appeared before 18 years of age in 8 (29.6 %) cases, between 18 to 24 in 8 (29.6 %), between 25 to 34 in 7 (25.9 %), between 35 and 44 in 3 (11.1 %), and between 45 and 54 years in 1 case (3.7 %).

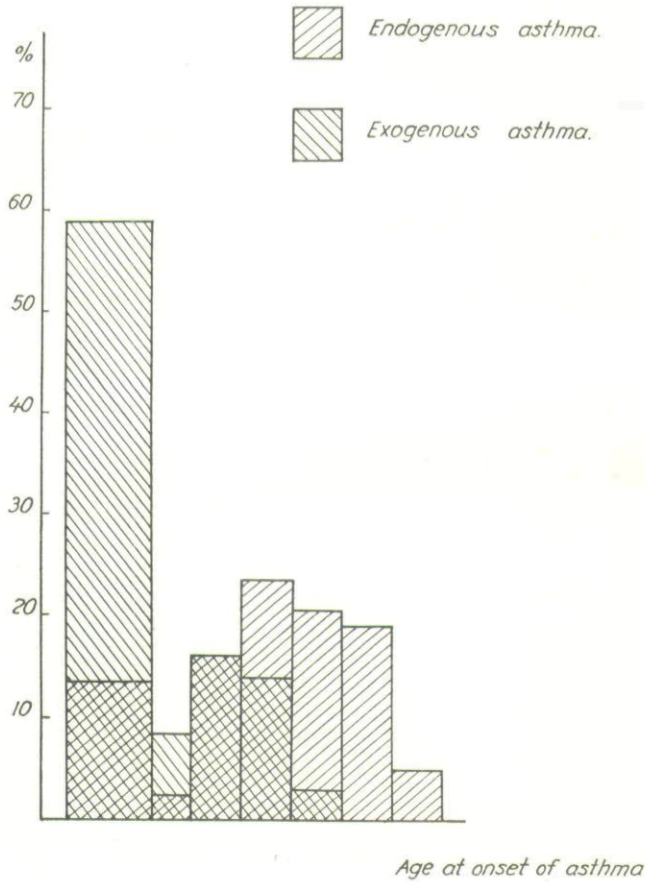


Fig. 6.
Percentage Distribution of Age of Onset of Asthma in 205 Endogenous
and 71 Exogenous Male Patients.

Account of Total Material.

This investigation thus shows that it is important in estimating the age of onset in asthma cases to include also the ages of patients when examined, and to consider endogenous and exogenous asthma separately. Concerning the *endogenous* cases, one finds that the age of the patients in this group for the most part was over 35. In the majority of cases the onset

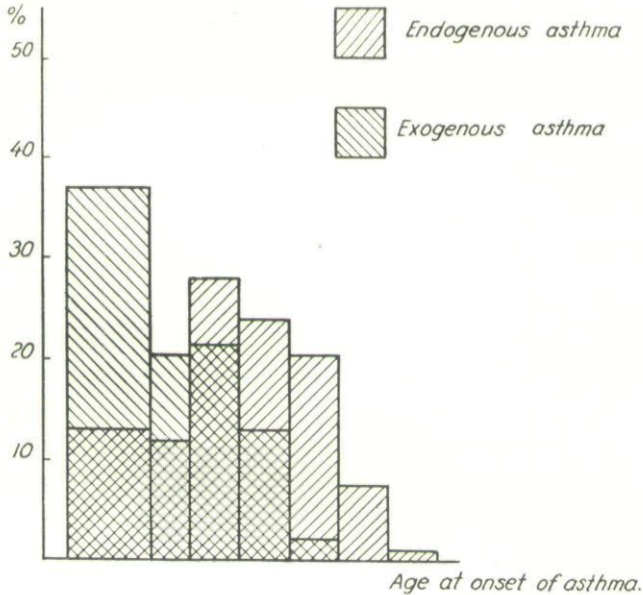


Fig. 7.

Percentage Distribution of Age of Onset of Asthma in 386 Endogenous and 54 Exogenous Female Patients.

of asthma also occurred in adulthood. Concerning the *exogenous* cases, their ages were much lower than those of the endogenous patients. At least partly for this reason, the ages of onset must be lower. In order to illustrate this the hospitalized patients as well as the out-patients have been placed together and the ages of onset in relation to their ages at the time of examination have been graphically illustrated, as shown in figures 6 and 7.

The differences here account for, between age classifications and age of onset in cases of endogenous and exogenous asthma suggest that there may exist an actual difference between these two types of asthma, so that, for example, the exogenous cases contract asthma earlier than the endogenous cases. It should therefore be possible to use the age of onset to differentiate between these two main groups of asthma patients in such a way that an early onset with greater

probability is evidence of the presence of exogenous asthma, while an onset in later years in all probability indicates asthma of an endogenous nature. These conclusions are thus fairly well in agreement with those which other authors have arrived at: e.g. *Rackemann, Abderhalden, Walker*.

SUMMARY

In conclusion it can be said that the age of onset in bronchial asthma has not been sufficiently considered in the literature. The age incidence may be of importance in understanding the origin and nature of the complaint. The data are often summary. A widely spread opinion is that asthma is a complaint which as a rule begins at an early age. However, it is evident that this need not be the case. In articles and papers where the patient's age when examined as well as the age of onset have been considered and where the different ages are more or less evenly distributed, it has been found that the onset can occur just as often or more often in adults as in childhood. However, it appears that patients with exogenous asthma are attacked earlier than those with endogenous asthma. In the same way the onset seems to occur earlier in cases of strong inheritance to allergic complaints than in cases without such a background. The number papers, etc., which touch upon these circumstances are, however, relatively few and from earlier dates.

The author's investigations show the importance in the first place of estimating the age of onset in relation to the patients age, and secondly of distinguishing cases with endogenous asthma from those with exogenous asthma. At least in this material, there is a clear distinction between those two groups.

Concerning the endogenous cases, the present investigation supports the observations made by other authors referred to above, that asthma is not an illness which begins especially often in childhood. On the contrary, only a few of these patients have been attacked before the age of 18. The majority

of them have not had any asthmatic distress whatever before becoming adult.

The exogenous cases on the other hand, have had the first onset of asthma with considerably greater frequency in childhood and adolescent years, and these discoveries support the authors who maintain that asthma begins early in life.

The present investigation thus indicate that there is a definite difference between exogenous and endogenous asthma.

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