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報 告

THE CHILDREN'S ASTHMA PROGRAMME— A SURVEY OF ITS EFFECTS

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ABSTRACT

The children's asthma class has been in existence since 1982. It is held every spring and autumn at Ioh National Infirmary in Kanazawa, Japan, with the co-operation of paediatricians, nurses, physiotherapists, and a physical education teacher.

In order to investigate the efficacy of the class a survey was carried out. It was found, according to the respondents' replies, that the frequency of asthmatic attacks decreased in the majority of the children, and participation in sports or physical activities—especially the physical education class at school and swimming—became regular. In addition, the children became more confident and outgoing, and the parents' knowledge and efficiency in managing their children during asthmatic attacks improved. The expertise of the physiotherapists in instructing breathing control, positions for relaxation, blowing the nose, and postural drainage formed an integral part of the class. It should, however, be considered that the subjective improvement of the bronchial asthma must be the result of the interaction of modalities offered by each discipline.

It is recommended that physiotherapists should get involved in the management of bronchial asthma as educators as well as therapists with the establishment of an exercise tolerance training programme in a physiotherapy department.

Thus, those children with bronchial asthma whose physical fitness is low would readily be referred to it by the physicians.

Key words: bronchial asthma, physiotherapy

Bronchial asthma is one of the most common disorders of childhood[1]. Its cause is still unknown but its clinical manifestation is the hypersensitive reaction of the muscles of the bronchioles[2] resulting in constriction of the airways with difficulty in breathing. The incidence of bronchial asthma in Japan is approximately one per cent of the total population[3], with 4 to 6 per cent of school children affected[4] and it is increasing year by year[3].

Various treatment modalities are in use today; namely, by the injection or inhalation of a bronchodilator[5], desensitisation[6], interval training[7], breathing control[8], and exercise[7]. The

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first two are fairly simple to prescribe and administer because they are 'passive' in nature. By 'passive', the authors' definition is 'minimal physical involvement on the patient's part in the procedure'. Although essential to the treatment regime, these passive modalities alone are not always satisfactory to both the physician and the patient. In contrast, 'active' treatment modalities—defined by the authors as 'active physical involvement on the patient's part in the procedure'—as for example, exercises, require the children's and, quite often, the parents' and schoolteachers' co-operation and participation. Furthermore, teaching exercises is primarily the domain of the physiotherapist in the hospital setting, with consequent indication for physiotherapists to get involved in the management of asthmatics. Consequently, questions as to the future development of physiotherapy in this field vis-à-vis the comprehensive approach in the management of bronchial asthma stimulated the present study.

REVIEW OF RELATED LITERATURE

Physiotherapy has been an integral part of the management of asthmatics in European and North American countries for many years. Such an involvement had rarely been heard of in this country until recently when an asthma programme and its result were reported in the literature[9]. This article described details of the class, though the exact role of the physiotherapist was relatively obscure. Neither did it mention the aspect of the children's exercise tolerance, though this topic was not the theme of this asthma programme, either. Although it has been shown through a residential programme that when physical exercise was given in the form of daily interval training the clinical state of the children improved significantly[7].

Sessions of relaxed breathing did not affect the physiological parameters of severely asthmatic children, though it was suggested that there was a tendency for the magnitude of each measure to decrease[8].

DESCRIPTION OF THE ASTHMA PROGRAMME

A children's asthma class was initiated in 1982 by paediatricians from the University of Kanazawa Hospital and Ioh National Infirmary in Kanazawa. This class was multidisciplinary in nature and was organised by paediatricians specialised in allergology, together with paediatric nurses, physiotherapists, a physical education teacher and several volunteers including student physiotherapists. Such a programme in which physiotherapists were involved was the first of its kind in the Hokuriku region of Japan. Parents

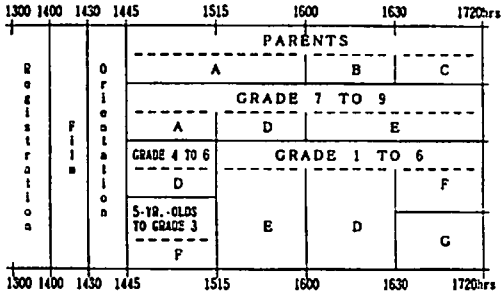

Fig. 1. Schedule of the asthma class

A: lecture by the paediatricians
B: observation of the class session conducted by the physiotherapists
C: group discussion
D: instruction by the physiotherapists on breathing control, positions for relaxation, coughing, blowing nose, and posture
E: exercise session conducted by the physical education teacher
F: recreational activities conducted by the nurses
G: individual consultation by the physiotherapists

were strongly recommended to attend with their children so that the theme of the class was orientated towards the family as a whole including child's sibling(s) and grandparent(s) rather than to the asthmatic alone. The principal aim of the programme was education for the participants

and immediate management during the acute stage. The class was held for one session on Saturday afternoon during spring and autumn, and, approximately one month later, a 'refresher' class was repeated to reinforce the learning process on the part of the participants.

The class commenced with a film on 'Exercise-induced Asthma' attended by all the participants (Fig. 1). It was followed by the paediatrician's lecture to the parents in which aetiology, pathophysiology, prognosis, and the treatment of asthma were explained. During this period the children were divided into three groups according to their school grade; pre-schoolers to Grade 3, Grade 4 to 6, and Grade 7 to 9. Two physiotherapists instructed each group in succesison on how to control their breathing during an asthmatic attack with the aid of diaphragmatic and pursed-lip breathing, the positions of relaxation in standing, sitting, and lying, how to clear and blow the nose effectively, and how to make a productive cough without inducing bronchial spasm. The children were then joined by their parents and the instruction was reviewed and demonstrated by the children themselves with the physiotherapists' explanation why each exercise was effective. In addition, postural drainage was shown and practised by the parents on the child, though it was not recommended for those asthmatics whose chests were free of secretion. The class closed with a question-and-answer session with the physicians presiding over several small separate group. Individual instruction was given at the same time by the physiotherapists to those parents and asthmatics who would benefit most from it. Parallel to this, a general exercise class was participated in by all the children to promote a feeling of well-being and to enjoy an exercise session under controlled conditions. This class was conducted by the physical education teacher and was designed specifically to meet the needs of asthmatic children with emphasis on thoracic mobility, posture, muscle strength, and fitness.

PURPOSE

Chest physiotherapy in general and the physiotherapist's role are not well understood nor clearly defined among the health care professionals in this country. It is sometimes seen in hospitals that some unqualified personnel such as bonesetters and masseuses are providing chest physiotherapy without having had any formal instruction. However, this service is not offered in many hospitals and, instead, nurses are trying to provide it often unsuccessfully. This is due to the relative unavailability of physiotherapists in this specialty and the unfamiliarity among physicians in the management of asthmatics utilising the expertise of the physiotherapist as a team member. To investigate the efficacy of the asthma class, a survey was undertaken in the winter of 1983/84.

METHODOLOGY

A questionnaire (Table 1) to be answered on behalf of the children was mailed to 70 participating parents who attended the class 3 or 4 times. Fourteen questions were provided and the decision to identify the parent's or guardian's name was left to the respondents. To each question, respondents were asked to tick an appropriate answer provided and, if necessary, to state an appropriate reason(s). No attempt was made in this survey to group the children according to the severity of asthma.

RESULTS AND DISCUSSION

The results were considered according to the kind of sample selected. The respondents were not randomly selected and were, therefore, not representative of all asthmatics. The findings

Table 1. Questionnaire

Please answer the following.

1. Name of the parent or guardian(optional):
2. Child's age and gender:
3. Period since the confirmation of diagnosis:
4. Frequency of asthmatic attack before the participation in the class:
   a) daytime: ( ) times monthly on average. Attacks occured mostly in ( ) month
   b) nighttime: ( ) times monthly on average. Attacks occured mostly in ( ) month
5. Was the asthma class useful to you?
   a) Yes, very much b) Yes, probably c) No, not at all
6. Please arrange in order of usefulness:
   a) film presentation b) paediatricians' lecture c) breathing control
   d) positions for relaxation e) postural drainage f) exercise
   g) group discussion
7. Does your child practise breathing control?
   a) Yes, regularly b) Yes, occasionally c) No, not at all
   If your answer is c), please indicate the reason below:
   ①He/She forgets to do it ②He/She usually does not need it ③Other (Please specify)
8. Is your child now able to control breathing during an asthmatic attack?
   a) Yes b) No c) Don't know
   If your answer is b), please indicate the reason below:
   ①Too distressing to do so
   ②Asthmatic attacks are severe
   ③He/She coughs too much
   ④Takes medication immediately
   ⑤Lack of practice
   ⑥Other (Please state specifically)
9. Compared to the asthmatic attacks last year;
   a) frequency of the attacks in daytime has:
   ①increased ②remained the same ③decreased
   b) frequency of the attacks in nighttime has:
   ①decreased ②remained the same ③increased
10. Does your child practise any of the following that has been instructed in the class? If so, please indicate the specific one(s):
    a) General exercise b) 'Fermata singing' c) Kanpu masatsu (rubbing down the body with a dry cloth) d) Other exercise(s) (please specify)
    If he/she does not practise any, please indicate the reason(s) from the following:
    ①He/She has forgotten it (them) ②He/She is too young to be able to do it (them)
    ③Other(s) (state specifically)
11. Did you carry out postural drainage whenever your child sounded chesty?
    a) Yes b) No c) He/She did not sound chesty at all
12. Does your child participate in a sport(s) or physical activity(ies) at least once a week?
13. Has your attitude towards and/or knowledge of bronchial asthma been changed by the asthma class?
    a) Yes b) No
    If your answer is a), please indicate below in what aspect it has been changed
    ①Medication ②Management during asthmatic attacks ③Prognosis of bronchial asthma ④Attitude towards daily life ⑤Physical exercise ⑥Hospitalization ⑦Other(s) (state specifically)
    If your answer is b), please indicate the reason below:
    ①I already know most of the content of the programme
    ②I cannot put my knowledge into practice
    ③I have my own way of managing bronchial asthma
    ④Other(s) (state specifically)
14. Has your child's attitude towards bronchial asthma and/or behaviour been changed?
    a) Yes b) No
    If your answer is a), please indicate which has been changed:
    ①Attitude towards asthmatic attacks
    ②Behaviour

(Thank you very much for your co-operation)

were thus descriptive of this specific sample alone.

Seventy per cent (49) of the questionnaires out of 70 was returned and analysed. Of these, elementary schoolers numbered 37 (76%), preschoolers 9 (18%) and junior high schoolers 3 (6%), respectively. The number of boys was 25 as opposed to 24 girls. Their average age was 9.9 years old (range: 3–15).

All the respondents wrote their childrens' name on the questionnaire sheet, which was not mandatory. It was not certain if this had inhibited or facilitated the answering of the questions.

The only question answered by all the respondents was question 8. Question 14 had the lowest answer rate (59%).

Table 2. Frequency of asthmatic attacks before the participation in the class*

Daytime(times/mos.) N=24		Nighttime(times/mos.) N=29	
Average	Range	Average	Range
2.0	0.5——10	3.6	0.5——10

* Most of asthmatic attacks occured during spring and autumn.

The number of asthmatic attacks varied widely among the respondents (Table 2). In this Table two cases of 30 attacks per month were excluded from computation. The fact that asthmatic attacks occured more during the night than the day and that these were generally seasonal complied with the textbook description of this condition[10].

Table 3. Items arranged in order of usefulness. N=31

Lectures by paediatricians > Positions to assume for relaxation during asthmatic attacks > Breathing control > Physical exercises > Postural drainage > Film on 'Exercise-induced Asthma' > Group discussion

The highest weighting regarding usefulness of the programme went to the lecture by the paediatricians followed by two components taught by the physiotherapists (Table 3). The fact that this question had the second lowest answer rate (63%) may have been due to the difficulty in weighting each item in preference among the seven. In fact, one respondent stated this difficulty instead of answering as required.

Ninety-six per cent (47) of the respondents felt the class useful (Question 5). The results generally complied with the principal aim described previously.

The reason why the film presentation was placed in low priority may have been because it was made in Norway, though the naration was in Japanese, therefore, it may have been difficult for the participants to relate it to themselves. Furthermore, the content of the film might also have affected their reaction; that is, it was based primarily on interval training which was not part of this programme. In addition to this, in the film it was always the father, not the mother, who took immediate care of their child during an asthmatic attack, whereas in this country these roles are almost always reversed.

There seemed to be a contradiction concerning the answers to questions 7, 8, 9 and 10 (Table 4, 5, 6, and 7); the majority experienced decreas-

Table 4. Does your child practice breathing control? N=48

Yes, regularly	Yes, occasionally	No, not at all
2(4%)	24(50%)	22(46%)

Please state the reason for 'No'

He/She forgets it	7(31%)
He/She usually does not need it	7(31)
He/She is too young to be able to	5(23)
His/Her condition is not so serious	1(5)
Asthmatic attacks do not occur because of regular medication	1(5)
Impossible to breathe in through the nose due to rhinitis	1(5)

Table 5. Is your child now able to control breathing during an asthmatic attack? N=49

Yes	Don't know	No
22(45%)	5(10%)	22(45%)

Please state the reason(s) for 'No'

Too distressing to do so	14(64%)
Lack of practice	7(31)
Takes medication immediately	5(23)
Too young to be able to manage	2(9)
Post-nasal drip due to allergic rhinitis	1(5)
Asthmatic attacks are very rare	1(5)

Table 6. Compared to the frequency of asthmatic attacks last year:

	Daytime attacks have now(N=42)	Nighttime attacks have now(N=45)
Increased	5(12%)	7(15%)
Remained the same	7(17%)	8(18%)
Decreased	30(71%)	30(67%)

Table 7. Does your child practise any of the following that has been instructed in the class? N=45

Yes	No
19(42%)	26(58%)
Please state specifically Kanpu nasatsu 6(31%) General exercise 3(16) 'Fermata Singing' 3(16) Other exercises* 7(37)	State the reason for 'No' Has forgotten it 7(27%) Too young to be able to practise 4(15) Others 15(58)

* Included postural and chest mobilisation exercises and Takefumi(stamping with one's feet on the longitudinal piece of a bamboo stick)

ed asthmatic attacks while it was found that more than half of the children had not practised breathing control or exercises at all. It was expected from the therapists' viewpoint that the more one practised it, the less frequent would become the asthmatic attacks. It should, therefore, be considered that the decrease in asthmatic attacks is effected by the interaction of each modality provided in the class. In addition, it is well known that, as the child grows, the asthmatic attacks become less.

It is very difficult[9] to motivate the child to practise breathing control during the lull period simply because he/she does not differ physically from any other individual at this time and does not feel the necessity of it. Nevertheless, approximately half of the respondents answered positively to question 8 (Table 5) and the general tendency definitely pointed towards subjective improvement of their condition as shown in Table 6.

Regarding the respondents who indicated the reason 'too young to be able to practise' in Table 4 and 7, all of their children were pre-schoolers or 3- to 5- year-olds. Generally speaking, 'infants' under six years are not suitable for class-work[11], therefore, they should be treated individually. Likewise, in those respondents who indicated the reason 'forgotten to practise' it was not certain whether their children had forgotten the techniques or they had somehow missed opportunities to practise despite their knowledge. The reason stated for 'Others' by the majority was that their childrens' mild condition did not warrant any exercise.

Regarding the question of postural drainage, 48 respondents answered in which 21 (44%) replied positively and 27 (56%) negatively. The negative answer included 15 (31%) respondents who stated that their children's chest always sounded clear. This confirmed the fact that some asthmatics were free of chest congestion despite their condition.

As far as sports were concerned the majority felt enthusiastic and took part in the regular physical education class at school (Table 8). Moreover, swimming—the least provoking of asthmogenic activities[5]—was part of the leizure time physical activity for more than half of the children. Swimming was recommended by the class instructors and the result showed participants' compliance and enhusiasm.

Table 8. Does your child now participate in a sport(s) or physical activity(ies) at least once a week? N=47

Yes				No
39(83%)				8(17%)
Please indicate the specific one(s) (more than one answer)	Physical education class at school	Swimming	Others*	
	32(82%)	22(56%)	17(44%)	

* Included baseball, softball, roller skating, badminton, soccer, jogging, table tennis, cycling, Kendo(Japanese fencing), going out to play, skipping, rubber-rope jumping

Question 13 and 14 dealt with the attitude of the participants in which the majority answered positively (Table 9 and 10). According to the parents' subjective opinion in question 14, their children generally became more confident and outgoing (Table 10).

It cannot be denied that a survey such as this —a relatively weak design as a research tool— might have, to a certain extent, limited the findings.

It was obviously beyond the scope of this survey to test the measure of physical tolerance against exercises, for the format of the class did

Table 9. Has your attitude towards and/or knowledge of bronchial asthma been changed by the asthma class? No=46

Yes	No
45(98%)	1(2%)

In what aspect has it been changed? (more than one answer)	
Management during asthmatic attacks	33(73%)
Attitude towards daily life	25(56)
Medication	21(47)
Physical exercise	13(29)
Hospitalization	3(7)

Table 10. Has your child's attitude towards bronchial asthma and/or behaviour been changed by the asthma class? N=29

Yes		No
27(93%)		2(7%)
Change of attitude	Change of behaviour	
19(70%)	8(30%)	

not allow this. There are a lot of asthmatics who are physically unfit and lack a great deal of confidence to exercise. The major cause of this unfitness is the fear of an asthmatic attack on exercising, which usually leads to a vicious circle according to the authors' observation. Therefore, an exercise tolerance training programme should be organised by physiotherapists and implemented preferably in a hospital-based physiotherapy department. Only then, the authors believe, the management of asthmatics can become comprehensive.

CONCLUSION

The children's asthma class was briefly described to explain a multidisciplinary approach to the management of asthmatics. A survey on this programme was conducted for the purpose of investigating its efficacy. The findings demonstrated the usefulness of the programme in which the expertise of physiotherapists was employed. The authors recommend that physiotherapists should routinely be involved in this field as educators as well as therapists and that a comprehensive asthma programme including exercise tolerance training should be established so that the physicians would be able to refer their patients whenever the need arises.

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要　旨

『親と子の喘息教室』の効果——アンケート調査より——

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『親と子の喘息教室』は小児科医，看護婦，理学療法士，その他の職員が協力して昭和57年以来春秋に一回づつ国立療養所医王病院で開かれている。この教室の効果を確かめるために参加者にアンケート調査を行った。それによれば参加した大多数の患者に於いて喘息発作の頻度が低くなり，運動——特に体育の授業や水泳——にも積極的に参加し，これにより精神的にも自信がつき，親も気管支喘息の対処法を活用できるようになった。理学療法士の役割，即ち呼吸コントロール，発作時にとる姿勢，体位排痰法，鼻をよくかむこと等の指導がこの教室の重要な一部であることもこの調査結果が示している。理学療法士はこのような教室へ『教育者』としても参加し，喘息管理の一部を担うのである。加えて，運動誘発性喘息の恐れ，過保護，その他による低体力の患児に対しては病院の理学療法部で運動耐容能増大訓練を計画し，定期的に実施することが望ましい。このようにして初めて気管支喘息の治療・管理が『包括的』だと言えよう。