◎原 著

Distant effects of spa therapy on steroid-dependent intractable asthma

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Abstract : The immediate effects (IEs) and distant effects (DEs) of spa therapy were observed in 67 patients with steroid-dependent intractable asthma (SDIA). (1)The IEs of spa therapy evaluated one week after spa therapy were considerably high, and the efficacy rate was 61.5% in type Ⅰa, 82.7% in type Ⅰb, and 83.4% in type Ⅱ asthmatics. (2)The DEs of spa therapy on SDIA were also observed. The efficacy rate was 50.2% in type Ⅰa, 54.3% in type Ⅰb and 63.7% in type Ⅱ asthmatics. (3)The DEs of spa therapy were different between cases with and without maintenance therapy (MT). The efficacy rate of DEs was generally high (72.8～91.7%) in cases with MT, and low (16.7～40.0%) in cases without MT. These results show that MT is very important to keep the IEs of spa therapy high for a long time.

Key words : Immediate effects, Distant effects, Maintenance therapy, Spa therapy, Steroid-dependent intractable asthma

Introduction

Asthma attacks are manifested by recurrent episodes of generalized airways obstruction, and usually reversible and controlable by usual anti-asthmatic drugs. In some patients, however, the attacks are severe and chronic, and very difficult for physicians to control without streroid regimen. Patients with so-called steroid-dependent intractable asthma (SDIA) require long-term therapy with corticosteroids to control their attacks.

Our previous studies showed that spa therapy including swimming training in a hot spring pool was effective in patients with SDIA[1～4]. Several authors have also reported the effects of siwimming training on bronchial asthma[5,6]. However, there are no reports about distant effects of spa therapy on SDIA.

In the present study, distant effects of spa therapy were evaluated at one year after the therapy finished.

Subjects and Methods

Subjects: The subjects were 67 patients, 33 females and 34 males, with SDIA. Their mean age was 51.3 years, ranging from 16 to 72 years. All cases were patients with SDIA, having had a long-term steroid therapy for longer than 2 years. All the subjects were admitted at Misasa Branch Hospital, and had spa therapy for 1 − 3 months.

Spa therapy : Spa therapy performed at Misasa Branch Hospital comprised swimming training in a hot spring pool, inhalation therapy with hot spring water or iodine salt solution[7], fango therapy on the back, drinking hot spring water and bathing.

Maintenance therapy : Swimming training in a hot spring or hot water pool at 1 to 2 times a week was continued as maintenance therapy (MT).

Clinical evaluation : The immediate effects (IEs) of spa therapy were estimated at one week and the distant effects (DEs) of the therapy were assessed at one year after 1 − 3 months spa therapy ended. The effects of spa therapy on bronchial asthma was assessed by four degrees ; marked, moderate, slight and no efficacy, according to changes in their symptoms and dose of drugs used. Spa therapy was evaluated to be effective when marked and moderate efficacy were recognized in the subjects.

Asthma classification : The subjects were classified into three groups; I a. bronchoconstriction type, I b. bronchoconstriction + hypersecretion type, and II . bronchiolar obstruction type, according to the clinical findings[8,9] . The asthma types are as follows.

I a. bronchoconstriction type : their attacks are elicited mainly by bronchoconstriction.

I b. bronchoconstriction + hypersecretion type: Their attacks are due mainly to hypersecretion (more than 100mℓ/day of expectration), in addition to bronchoconstriction.

II . bronchiolar obstruction type : their attacks are elicited mainly by bronchiolar obstruction.

According to asthma classification above mentioned, the subjects comprised 26 cases with type I a (11 females and 15 males, mean age ; 45.9 years), 29 cases with type I b (16 females and 13 males, mean age ; 52.2 years), and 12 cases with type II (6 females and 6 males, mean age ; 62.8 years).

Results

1. The IEs of spa therapy on SDIA.

The IEs (definite efficacy ; marked and moderate) of spa therapy on SDIA were observed in 50 cases (74.6%) out of the 67 cases. The definite efficay was the highest (83.4%) in cases with type II and the lowest (61.5%) in cases with type I a. Any efficacy was not observed in 5 cases (19.2%) out of the 26 cases with type I a (Table 1).

Table 1. Clinical effects of spa therapy on patients with steroid-dependent intractable asthma

Clinical asthma type	No of cases	Efficacy			
		Marked	Moderate	Slight	No
Ia	26	7 (26.9%)	9 (34.6%)	5 (19.2%)	5 (19.2%)
		61.5%			
Ib	29	9 (31.0%)	15 (51.7%)	5 (17.3%)	0
		82.7%			
II	12	5 (41.7%)	5 (41.7%)	2 (16.6%)	0
		83.4%			
Total	67	21 (31.3%)	29 (43.3%)	12 (17.9%)	5 (7.5%)
		74.6%			

Ia : Bronchoconstriction type, Ib : Bronchoconstriction + hypersecretion type, II : Bronchiolar obstruction type.

2. Comparison of IEs with DEs of spa therapy on SDIA.

The DEs of spa therapy on SDIA were observed in 13 cases (50.2%) including 5 marked efficacy cases (20.0%) out of the 25 cases with type I a, in 13 cases (54.1%) including

5 marked efficacy cases (20.8%) out of the 24 cases with type I b, and 7 cases (63.7%) containing 4 marked efficacy cases (36.4%) out of the 11 cases with type II.

The efficacy rate of IEs to DEs decreased from 61.5% to 50.2% (−11.3%) in cases with type I a, from 82.7% to 54.1% (−28.6%) in cases with type I b, and from 83.4% to 63.7% (−19.7%) in cases with type II. A decrease ratio was higher in cases with type I b and II compared to that in type I a (Fig. 1).

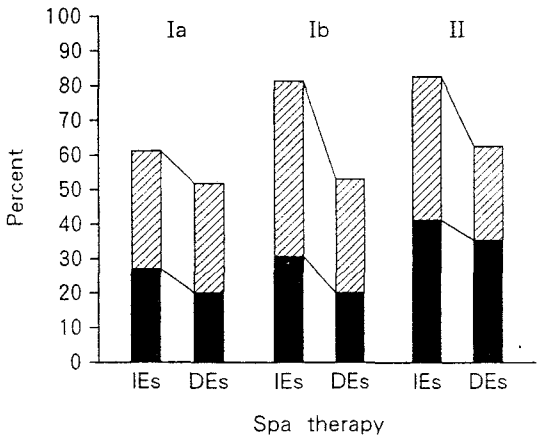

Fig. 1. Comparison of immediate effects (IEs) with distant effects (DEs) of spa therapy on steroid-dependent intractable asthma. I a : Bronchoconstriction type, I b : Bronchoconstriction + hypersecretion type, II : Bronchiolar obstruction type. Efficacy : ■ ; Marked, ▨ ; Moderate.

3. Clinical significance of maintenance therapy

After spa therapy in hospital ended, swimming training in a hot spring or hor water pool near the patients' residence was continued 1 − 2 times a week as MT. However, some patients could not continue the training because of various reasons. The DEs of spa therapy were different between the two groups ; with and without MT. The DEs were observed in 8 cases (72.8%) out of the 11 cases with MT, and in 5 cases (35.7%) out of the 14 cases without MT in type I a asthmatics. While the DEs were evaluated in 11 cases (91.7%) out of the 12 cases with MT, and in only 2 cases (16.7%) out of the 12 cases without MT in type I b asthmatics. In type II asthmatics, 5 cases (83.4%) out of the 6 cases with MT and 2 cases (40.0%) out of the 5 cases without MT were evaluated as definite efficacy cases. No marked efficacy cases in DEs were observed in type I b and II cases without MT (Fig. 2).

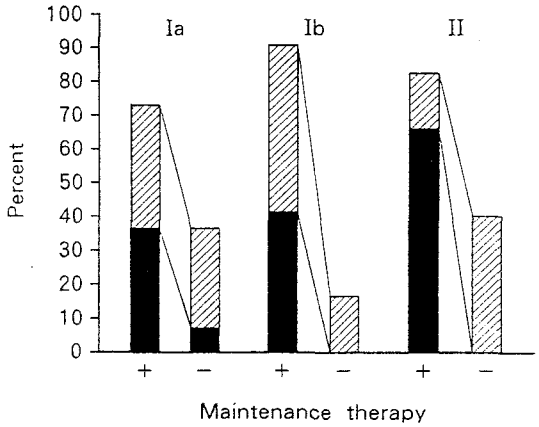

Fig. 2. Distant effects (one year later) of spa therapy and maintenance therapy (swimming traning in a hot water pool) in steroid-dependent intractable asthma.
I a : Bronchoconstriction type, I b : Bronchoconstriction + hypersecretion type, II : Bronchiolar obstruction type. Efficacy: ■ ; Marked, ▨ ; Moderate.

4. Clinical course of SDIA

Clinical course of SDIA was observed for one yere after spa therapy. Their symptoms were improved in no cases out of the 25 type I a cases with or without MT, in one case (8.3%) out of the 12 type I b cases with MT, and in 2 cases (33.3%) out of the 6 type II cases with MT. The symptoms were not improved in any cases without MT.

On the other hand, their symptoms became worse in 2 cases (14.3%) out of the 12 type I a cases without MT, in one case (8.3%) out of the 12 type I b with MT, 10 cases (83.3%) out of the 12 type I b without MT, and 5 cases (83.3%) out of the 6 type II without MT. Frequency of cases, whose symptoms became worse, was low in cases with MT regardless of asthma types (Fig. 3).

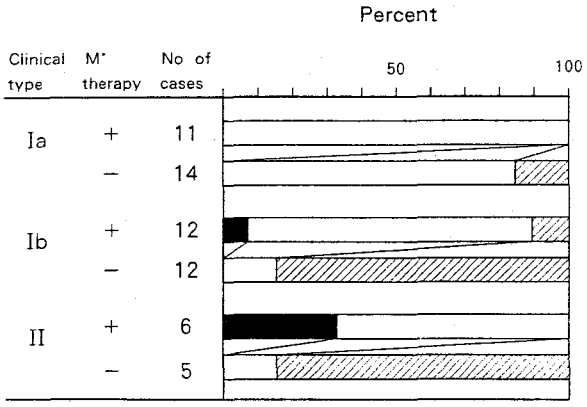

Fig. 3. Clinical course of patients with steroid-dependent intractabse asthma for one year after spa therapy. Symptoms : ■ ; Improved, □ ; Not changed, ▨ ; Worse. I a : Bronchoconstriction type, I b : Bronchoconstriction + hypersecretion type, II : Bronchiolar obstruction type. M* therapy : Maintenance therapy.

Discussion

In spite of development of new medications for bronchial asthma, it has been more difficult for physicians to control and improve their symptoms without glucocorticoids regimen. Especially, in patients with SDIA, their symptoms can not be completely improved by all other supportive therapies except glucocorticoids regimen. Spa therapy for bronchial asthma has been expected to be one of the useful therapies applied without adverse side effects[1~3].

Our previous studies about the IEs of spa therapy on patients with SDIA, showed that spa therapy improved their ventilatory function after swimming training in a hot spring pool[3,10]. The results demonstrated that the values of ventilatory parameters such as %FVC, FEV1.0%, %PEFR, %MMF, %$\dot{V}$50, and %$\dot{V}$25 increased after the 3−month swimming training, and that out of these parameters, the percent increase in %MMF, %$\dot{V}$50 and %$\dot{V}$25 was more remarkable than the increase in FEV1.0%, suggesting spa therapy is more effective and useful for improvement of smaller airways obstruction.

In the present study, IEs and DEs of spa therapy on SDIA were observed at one week and at one year after spa therapy ended. The definite efficacy rate (IEs) of spa therapy were 61.5% in type I a asthma, 82.7% in type I b cases and 83.4% in type II cases, being considerably high. That is, spa therapy was shown to be effective even in cases with SDIA, especially in tye I b and II SDIA cases. The DEs of spa therapy were observed in SDIA at efficacy rate from 52.0% to 63.7%. The efficacy rate was affected by MT (swimming training in a hot spring or hot water pool 1 − 2 times a week).

The DEs of spa therapy were generally high in cases with MT, while the DEs were low in cases without MT, especially in type Ib and II cases without MT. The results showed the DEs for type I b and type II cases decreased when the patients with SDIA did not receive MT after spa therapy. Therefore, MT was thought to be very important to keep the IEs of spa therapy high for a long time.

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ステロイド依存性重症難治性喘息に対する温泉療法の遠隔効果

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67例のステロイド依存性重症難治性喘息を対象に，温泉療法を行い，その即時的効果（1週間後）および遠隔効果（1年後），さらには，温泉療法後の継続療法の影響などについて検討を加えた。1.温泉療法1週間後の即時的効果は比較的高く，その有効率は，Ⅰa.気管支攣縮型で61.5%，Ⅰb.気管支攣縮＋過分泌型で82.7%，Ⅱ．細気管支閉塞型で83.4%であった。2.温泉療法の遠隔効果では，その有効率は，Ⅰa型で50.2%，Ⅰb型で54.1%，Ⅱ型で63.7%であった。3.温泉療法の遠隔効果は，その後の継続療法の有無によりかなり異なった結果であった。すなわち，継続療法を行った症例の有効率は，72.8～91.7%と高く，一方，継続療法を行わなかった症例の有効率は，16.7～40.0%の間にあった。これらの結果から，温泉療法の即時的効果を保つためには，その後の継続療法が極めて重要であることが示唆された。

キーワード：即時的効果，遠隔効果，継続療法，温泉療法，ステロイド依存性重症難治性喘息