Clinical picture of combination therapy (metronidazole sustained release film with minocycine hydrochloride) in preiodentitis

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Abstract: This paper aimed to study the effect of metronidazole sustained-release film combined with minocycline hydrochloride on treating periodontitis. 138 patients with chronic periodontitis were collected and randomly divided into control group and observation group (each of 69 cases). Patients in control group were treated by using minocycline hydrochloride, while those in observation group were treated using metronidazole sustained-release film with minocycline hydrochloride, and each group with 4 weeks of treatment. Then we observed the periodontal mend matters, therapeutic effect, adverse reaction and relapse situation of patients in two groups. Results showed that compared with the prior treatment, the gingival index, dental plaque index, odontoseisis index and pocket depth of patients in two groups was significantly reduced. Moreover, the reduction range in observation group was significantly larger and the curative effect was superior to that in control group. Therefore, metronidazole sustained-release film combined minocycline hydrochloride can evidently improve patients' periodontal status, enhance drug therapeutic effect. It has less adverse reaction and low relapse rate, thus is worthy of clinical promotion.

Keywords: metronidazole sustained-release film, minocycline hydrochloride, combined effect, periodontitis, bacteriostasis

INTRODUCTION

Periodontitis is a kind of common oral inflammatory disease, and its clinical manifestations are gum bleeding, inflammation and periodontal pocket formation. Acute periodontitis is mostly treated using mechanical treatment, but it is very likely to cause heavy damage and pocket deepening of periodontium if patients do not active in treatment after the illness. Therefore, the clinical effect of pure mechanical treatment is often unsatisfactory, for which often has problem of pathogenic bacteria in gingival tissue that is difficult to be completely eradicated (Chao, 2013; Liqun *et al*., 2012). The adoption of antibiotic in treating periodontitis is currently ubiquitous treatment. The new type periodontitis treatment is use local sustained-release drugs. Through analysis of 60 periodontitis patients treated by metronidazole sustained-release film, Ding Li (Li, 2011). verified that the therapeutic effect of metronidazole sustained-release film on periodontitis is significant, and its clinical symptoms and signs improved significantly. Through the observation of treating periodontitis with minocycline hydrochloride combined tinidazole of local application, Wang Yinfu, Zhou Bing and Mao Xiaochun (Yingfu, 2011; Bing, 2014; Xiaochun, 2013) found that the effect was significant, thus its clinical application deserves promotion. In addition, through the combined utilization of minocycline hydrochloride and metronidazole sustained-release film in treating chronic periodontitis, Liao Xuefeng, Tang Lijuan, *et al* (Xuefeng, 2014; Lijuan, 2013) found that the combination of the two can obviously improve periodontal status and enhance curative effect. Moreover, combination of the two has low relapse rate and adverse reaction. This study conducted for the combined application of drugs based on the above mentioned basis so as to observe the curative effect, which provided basis for clinical promotion of combination therapy.

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MATERIALS AND METHODS

Study design

Patient selection: A total of 138 patients with chronic periodontitis treated between November 2011 and November 2013 in the central hospital of Xinxiang city were collected.

Inclusion criteria: All these patients were all single tooth disease. The tooth position investigation depth of periodontal pocket was over 4mm, and its periphery appeared gum redness and swelling and pain with different degrees of gum bleeding or gomphiasis. X ray examination shows alveolar resorption.

Exclusion criteria: We excluded all those patients with other diseases like infectious disease, blood disease, immune disease, cardiopulmonary disease, liver and kidney disease, mental disease and drug hypersensitivity.

Experiment grouping: All of these patients recently did not use antibiotic and periodontal specific treatment. According to treatment, they were divided into two groups. 69 patients treated with minocycline hydrochloride was control group, ranging in age from 17 to 73 years (mean 51.2±13.6 years). Of the 69 patients, 41

were men and 28 women. Another 69 patients treated with minocycline hydrochloride combined metronidazole sustained-release film was observation group, ranging in age from 18 to 69 years (mean 50.3±14.2 years) and of which 43 were men and 26 women. Comparison of general conditions like year, gender, etc between two groups were all of no statistical significance ($p>0.05$), thus the two groups were of comparability.

Method

Patients in control group were treated with minocycline hydrochloride (trade name: Periocline, Japanese Sunstar INC Company, register certificated no: H20100244). Patients were treated with scaling and the tooth root was planed. After adjusted the occlusion, 0.02% chlorhexidine was used to rinse periodontal pocket and 0.05mL minocycline hydrochloride was injected into periodontal pocket by special needle until it was full. Patients could not gargle and eat anything within 30 minutes of injection and the above mentioned injection was performed once a week and the duration was four weeks. Patients in observation group were treated with metronidazole sustained-release film (Shanxi Jinxin Shuanghe Pharmaceutical Co., Ltd.) combined minocycline hydrochloride. The usage of minocycline hydrochloride was the same as that in control group. According to the pocket depth, appropriate minocycline hydrochloride was selected with dentistry nickel and it was applied to the bottom of periodontal pocket, once every two days and the course was four weeks. Informed consents of all the patients and their relatives were signed before the treatment, and the therapeutic schedule was approved by the Medical Ethics Committee.

Observational indexes

The observation index of patients with chronic periodontitis: Periodontal mend matters (gingival index, dental plaque index, odontoseisis index and pocket depth), therapeutic effect (marking effective, effective, invalid, total effect), adverse effect condition (nausea, papule, insomnia, gastrointestinal reaction), relapse condition.

Evaluation criteria

Evaluation criteria are as follows. Marking effective: patients' gum is bleeding and tumor symptoms disappear, and gomphiasis obviously relieves. Pocket depth declines by 2mm and gingival index lowers over 50%. Effective: patients' gum is bleeding and tumor symptoms relieve, and gomphiasis obviously relieves. Pocket depth declines by 1mm. Invalid: patients' gum is bleeding and tumor symptoms have no improvement and pocket depth also without decline. Total effect equals to marking effective plus effective.

Statistical treatment

Data information is statistically treated and analyzed using SPSS 16.0 software and measurement data are all expressed by mean ± standard deviation. Measurement data is tested using T test (student's t test) and enumeration data tested by X^2. $P<0.05$ shows that the difference is of statistical significance.

EXPERIMENTAL RESULTS

Comparison of periodontal mend matters in two groups

Comparison of periodontal mend matters in two groups showed that the post operative gingival index, dental plaque index, gomphasis index, pocket depth in two groups all significantly decreased and that in observation group were all obviously lower than that in control group, thus the difference was of statistical significance ($p<0.05$). As shown in table 1

Comparison of therapeutic effect of patients in two groups

The comparison of therapeutic effect of two groups showed that the total effective rate in observation group was obviously higher than that in control group, the total effective rate was up to 95.7% and the difference was statistically significant ($p=0.041$). As shown in table 2

Adverse reaction condition and relapse condition of patients in two groups

The observation of the adverse reaction and relapse of two groups showed that the adverse reaction rate in observation group was higher than that in control group, and the difference was of no statistical significance ($p=0.698$). However, the relapse rate in observation group was lower than that in control group, and the difference was statistically significant ($p=0.029$). As shown in table 3

DISCUSSION

With the improvement of living standard, oral hygiene attaches more and more people's attention. Chronic periodontitis is the common oral local infected disease. Parts of patients do not receive timely treatment because of the not obvious symptoms. If they do not treat it timely, it is very like to lose its masticatory function and finally fall off, which seriously affect patients' normal diet and pronounce (Lijuan. 2013). The common pathogenic bacterium of chronic periodontitis is gram-negative anaerobion which adheres to the surface of tooth and methods like gargle and water washing are difficult to remove the micropopulation on the surface of tooth, thus plaque comes into being. Mineralized plaque that disposed on the surface of tooth for a long time can form into tartar. According to the disposition position and nature, tartar is divided into supragingival calculus and subgingival calculus, of which supragingival calculus is mainly from mineral salt like calcium and phosphorus in saliva, while subgingival calculus is mainly made up of the mineral salt provided by gingival crevicular fluid and transudation (Xuefeng, 2014). The traditional pure

Table 1: Periodontal mend matters in two groups

Group		n	Gingiva index	Plaque index	Gomphiasis index	Pocket depth
Control group	Prior treatment	69	2.19±0.53	1.38±0.42	2.23±0.65	5.32±0.74
	Post treatment	69	1.37±0.38	1.12±0.26	1.69±0.53	4.53±0.62
	t		8.791	5.294	6.172	4.763
	P		0.004	0.038	0.029	0.042
Observation group	Prior treatment	69	2.17±0.46	1.40±0.37	2.21±0.58	5.29±0.64
	Post treatment	69	0.68±0.21*	0.82±0.19*	0.64±0.20*	3.85±0.71*
	T test		29.416	10.231	32.158	6.637
	P		0	0	0	0.024

Note: * refers to the comparison with control group after treatment, p<05.

Table 2: Comparison of therapeutic effect of two groups n (/%)

Group	n	Marking effective	Effective	Invalid	Total effect
Control group	69	28 (40.6)	31 (44.9)	10 (14.5)	59 (85.5)
Observation group	69	43 (62.3)	23 (33.3)	3 (4.3)	66 (95.7)
X^2					4.161
P					0.041

Table 3: Adverse reaction and relapse condition of two groups n (/%)

Group	n	Nausea	Papule	Insomnia	Gastrointestinal reaction	Adverse reaction condition	Relapse condition
Control group	69	1 (1.4)	0 (0.0)	1 (1.4)	1 (1.4)	3 (4.3)	7 (10.1)
Observation group	69	2 (2.9)	1 (1.4)	0 (0.0)	1 (1.4)	4 (5.8)	1 (1.4)
X^2						0.150	4.777
P						0.698	0.029

mechanical method may cause larger pain to patients and it is easy to relapse. Its effect is not quite satisfactory. However, the cooperation of effective drug of local application can strengthen antibiotic therapy and its effect is far superior to traditional methods.

Metronidazole sustained-release film and minocycline hydrochloride are common drug in current clinical treatment of periodontitis. Metronidazole can effectively anti anaerobion drugs and can obviously improve gingival swelling and bleeding. In addition, it also is good to eliminate periodontitis and stabilize gomphiasis. It can be made into drug and then applied to the bottom of periodontal pocket. At the same of balances the physiologic stress of periodontium and mends periodontium, it also guarantees the security of it application (Rong, 2012; Zengwei, 2010; Jing, 2011). Minocycline hydrochloride is a kind of new periodontal local controlled release formulations which has broad-spectrum antibacterial effect on gram-negative bacteria like Escherichia coll, Cray bacillus, enteric bacilli and grampositive bacteria like staphylococcus, pneumobacillus. It not only can prevent the protein synthesis of bacteria thus to against bacteria, but also can promote the proliferation of periodontal ligament fibroblasts, inhibit and destroy periodontium and the activity level of relevant collagenase which forms periodontium. In addition, it also can stabilize tooth and promote periodontal tissue regeneration, and the effective drug concentration can lasts for about 7 days (Hongjun, 2012; Limin and Feng, 2013; Shuang, 2013).

Results of this study showed that the post operative gingival index, dental plaque index, gomphasis index, pocket depth in two groups all significantly decreased, and that in observation group were all obviously lower than that in control group. The total effect in observation group is significantly higher than that in control group and the adverse reaction rate was not obviously higher than that in control group. In addition, its relapse rate was significantly lower than that in control group. The above results showed that the therapeutic effect of metronidazole sustainedrelease film combined minocycline hydrochloride is superior to single drug application. Moreover, the combination of two has significantly enhanced the success rate of treatment and has higher security. It also has lesser adverse reactions. Thus it is suitable for various people who suffers from periodontitis.

CONCLUSION

In conclusion, metronidazole sustained-release film combined minocycline hydrochloride is an effective drug to treat chronic periodontitis, for it can apparently reduce gingival index, plaque index, gomphasis index and pocket depth so as to improve periodontal condition. Moreover,

its therapeutic effect is evident and with less adverse reactions and low relapse rate. Therefore, it has good clinical effect and is worthy of promotion.

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