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Original article

Application value of high-quality nursing combined with methylprednisolone in treatment of sudden deafness

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Abstract: *Objective:* Explore the application value of high-quality nursing combined with methylprednisolone in the treatment of sudden deafness. *Methods:* The patients who came to our hospital for treatment due to sudden deafness from January 2017 to December 2019 were selected as the research object and were divided into a control group (n=65) and an observation group (n=65) according to the random number table method. The group used routine nursing intervention, and the observation group used high-quality nursing intervention combined with methylprednisolone intervention to compare the efficacy, negative emotions, quality of life, nursing satisfaction and PTA of the two groups. *Results:* The effective rate of the observation group was 90.77% higher than that of the control group of 76.92%, the difference was statistically significant (P <0.05); the SAS and SDS scores of the two groups before intervention were compared, and there was no statistically significant difference (P>0.05), The SAS and SDS scores of both groups decreased, and the observation group was significantly lower than the control group, the difference was statistically significant (P <0.05); the quality of life score of the observation group after intervention was higher than the control group, the difference was statistically significant (P <0.05); the nursing satisfaction of the observation group was 90.77% significantly higher than that of the control group 73.85%, the difference was statistically significant (P <0.05); the PTA of both groups decreased after intervention, and the PTA of the observation group was lower than that of the control group , The difference was statistically significant (P<0.001). *Conclusion:* High-quality nursing combined with methylprednisolone has a significant effect on sudden deafness, which can relieve patients' negative emotions, improve quality of life and nursing satisfaction, and is worthy of promotion.

Key words: High-quality care; methylprednisolone; sudden deafness; application value

Introduction

Sudden deafness refers to the sudden sensorineural deafness with unknown causes (1), which is mainly manifested as a sudden decline in hearing within minutes or hours or within 3 days. It not only damages the patient's hearing, but also affects the patient's vision, nervous system and digestive system (2). At present, the clinical pathogenesis of sudden deafness has not been clearly identified, which may be related to viral infection, disruption of the labyrinth, and disturbance of microcirculation in the inner ear, etc. (3). Sudden deafness is urgent, and the psychological impact of patients is often huge, resulting in anxiety, depression and other negative emotions (4). Conventional nursing intervention has a poor effect on patients' negative emotions and quality of life (5). Therefore, it is of great significance to find a more effective intervention method. Quality care is a new type of care designed for patients, which plays a positive role in the treatment of patients (6). Methylprednisolone is a new glucocorticoid for the treatment of sudden deafness, which has been recognized by the clinic. At present, there are few reports on the treatment of sudden deafness by

high quality nursing combined with methylprednisolone. Methylprednisolone is a drug synthesized from glucocorticoids, which has a strong anti-inflammatory effect and the function of regulating endocrine balance and nervous system (7, 8). Glucocorticoids can rapidly diffuse in the body, penetrate the cell membrane, rapidly bind to specific receptors, and then enter the nucleus to bind to chromosomes, and then conduct mRNA transcription, and then synthesize various enzyme proteins, and finally act on the whole body. Methylprednisolone can effectively treat inflammation, inhibit phagocytosis, reduce blood vessel dilation, and promote fat metabolism, protein metabolism and carbohydrate metabolism. The inhibitory effect of glucocorticoids on immune response is relatively strong, which can promote the microcirculation of the inner ear and reduce the hydroponysis of the labyrinth in patients (9). In this study, the patients with sudden deafness in our hospital were given high-quality nursing combined with methylprednisolone intervention to provide reference for the clinical treatment of sudden deafness.

Materials and Methods

General information

Patients with sudden deafness who were admitted to our hospital for treatment from January 2017 to December 2019 were selected as research objects. Inclusion criteria: (1) meeting the clinical diagnostic criteria of the Spanish society of otolaryngology, head and neck surgery (7), sudden deafness by imaging examination;(2) the results of examination of vestibular function and multi-frequency steady-state showed no abnormality, and tympanogram were all type A;(3) acoustic impedance or pure tone audiometry were all accepted;(4) all signed informed consent. Exclusion criteria :(1) combined with inner ear deformity;(2) combined with otitis media;(3) combined with cerebellopontine Angle or lesions of the auditory tract; (4) not actively cooperating with the researcher. This study was approved by the ethics committee of our hospital. Finally, 130 patients were included and divided into the control group (n=65) and the observation group (n=65) according to the random number table method. There was no statistically significant difference in the general data of the two groups (P > 0.05, table 1).

Control group

The control group used routine nursing intervention to carry out routine health knowledge education for patients, popularize simple disease knowledge to give patients routine diet and exercise intervention, instruct patients to strictly follow the doctor's advice to use drugs and actively communicate with patients to eliminate the negative emotions of patients.

Observation group

Based on the control group, the observation group was given high quality nursing intervention combined with methylprednisolone treatment. Quality nursing intervention, (1) psychological nursing: sudden deafness is urgent, the patient's psychology is often a huge impact, anxiety, depression and other negative emotions. Nurses actively communicate with patients, care about the patient's concerns, in the communication to maintain a positive attitude, with a kind and gentle attitude to eliminate the patient's alert psychology, fully understand the patient's loss of hearing invariability, patiently answer the patient's questions by writing, gesture and other ways, transfer the correct concept to improve the patient's self-confidence. (2) behavioral activity nursing:

Table 1. Comparison of general data between the two groups

Group	n	Gender		Ear		Tinnitus		Average age(year)
		Male	Female	Left	Right	Have	No	
Observation	65	34	31	36	29	43	22	41.23±6.25
Control	65	32	33	34	31	40	25	42.37±6.17
t/χ^2		0.123		0.124		0.300		1.047
P		0.726		0.725		0.584		0.297

nurses can divert patients' attention and reduce their negative emotions by guiding them to conduct muscle relaxation training and playing the soothing factors of the patient's hobby one time and do breathing training one time. During the training period, the patient should be guided to concentrate, breathe slowly and relax, and breathe in and out in a circular abdominal manner, 5min at a time, three times a day (8). (3) publicity and education of health knowledge: nursing staff will conduct health knowledge training for patients in an organized way, explain the etiology, matters needing attention, examination process, treatment plan and other knowledge of sudden deafness, and then explain in detail the individual situation of patients. (4) environmental comfort care: for patients with sudden deafness, they often feel fear, confusion and other emotions during hospitalization. Nursing staff can provide face-to-face services to patients at the beginning of their admission, introduce the situation of the hospital, help patients get familiar with the facilities and environment of the hospital, and eliminate strangeness (9). On the other hand, creating clean, bright, clean and transparent ward environment, according to the preferences of patients, dressing up flowers or green plants make patients feel happy. Intraventricular methylprednisolone was administered to patients (Pfizer Manufacturing NV; Approval number: H20130301; Specification: 40mg), injection dose 40mg, 1 time /3d, 5 times continuous injection. The specific methods are as follows: The tympanic membrane was anesthetized with 2% lidocaine and the external auditory canal was disinfected with 70% alcohol. The patient was instructed to take the supine position, keep the head to the opposite side of 45°, conduct tympanic membrane puncture, and then inject 40mg methylprednisolone into the femoral chamber. The patient was instructed not to swallow during the injection. The alcohol cotton ball was placed in the external auditory canal of the patient, removed it on the next day, 1 time /3 days, and continuously injected for 5 times.

Observation indicators

(1) efficacy. 1) recovery: the impaired frequency hearing threshold returned to the level before the disease or returned to normal; 2) obvious effect: the hearing of impaired frequency increases ≥30dB; 3) effective: hearing of impaired frequency increased by 15 ~ 30dB; 4) invalid: hearing of impaired frequency was not improved or increased by less than 15dB. (2) negative emotions. 1) the anxiety self-rating scale (SAS) was used for scoring, in which severe anxiety (over 69 points), moderate anxiety (60 ~ 69 points), mild anxiety (50 ~ 59 points), normal (under 50 points). 2) the depression self-rating scale (SDS) was used for scoring, in which severe depression (72 points or more), moderate depression (63 ~ 72 points), mild depression (53 ~ 62 points), normal (53 points or less). 3) quality of life: Each of the total score of 100 points including psychological, emotional, physical, social, the higher score means better the quality of life. (4) nursing satisfaction. Nursing satisfaction was evaluated according to the questionnaire designed by the medical staff, with 7 items, ranging from "very dissatisfied" to "very satisfied", and the satisfaction rate = (general + satisfaction + very satisfied)/total ×100%. (5) average listening threshold of gas-conduction pure tone (PTA). PTA of the two groups were compared before and after intervention on 1d, 7d and 14d.

Statistical methods

SPSS 24.0 statistical software was used to process the data. The quantitative data was expressed as ($\bar{x}\pm s$), and t-test was conducted. The qualitative data was expressed as n (%). The disordered data were tested as χ^2test, and the orderly rank sum test was conducted. $P < 0.05$ was statistically significant.

Results

Comparison of curative effect between the two groups

The effective rate of observation group was 90.77% higher than that of control group (76.92%) ($P < 0.05$) (Table 2).

Comparison of SAS and SDS scores between the two groups

There was no statistically significant difference in SAS and SDS scores between the two groups before intervention ($P > 0.05$). After the intervention, the

Table 2. Comparison of efficacy between the two groups (n, %)

Group	Case	Recovery	Obvious	Effective	Invalid
Observation	65	32(49.23)	14(21.54)	13(20.00)	6(9.23)
Control	65	21(32.31)	18(27.69)	11(16.92)	15(23.08)
Z		-2.117			
P		0.034			

Table 3. Comparison of SAS and SDS scores between the two groups($\bar{x}$±s, score)

Group	Case	SAS		SDS	
		Before	After	Before	After
Observation	65	56.47±5.21	48.33±4.31*	55.37±4.85	50.88±3.41*
Control	65	57.13±4.97	53.24±5.14*	56.33±4.78	53.66±4.22*
t		0.739	5.901	1.137	4.131
P		0.461	<0.001	0.258	<0.001

Table 4. Comparison of quality-of-life scores between the two groups($\bar{x}$±s, score)

Group	n	Psychological	Emotional	Physical	Social
Observation	65	78.39±8.42	81.44±8.77	77.33±7.51	78.99±8.63
Control	65	65.38±7.14	71.84±7.35	61.35±6.81	67.41±6.42
t		9.501	6.764	12.711	8.680
P		<0.001	<0.001	<0.001	<0.001

Table 5. Comparison of nursing satisfaction between the two groups (n, %)

Group	n	Very satisfied	Satisfied	General	Unsatisfied	Very Unsatisfied
Observation	65	34(52.31)	14(21.54)	11(16.92)	4(6.15)	2(3.08)
Control	65	23(35.38)	18(27.69)	7(10.77)	10(15.38)	7(10.77)
Z				-2.208		
P				0.027		

SAS and SDS scores of the two groups were decreased, and the observation group was significantly lower than the control group, the difference was statistically significant (P < 0.05) (table 3).

Comparison of quality of life between the two groups

After intervention, the quality-of-life score of the observation group was higher than that of the control group, and the difference was statistically significant (P < 0.05) (table 4).

Comparison of nursing satisfaction between the two groups

The nursing satisfaction of the observation group was 90.77% higher than that of the control group (73.85%), and the difference was statistically significant (P < 0.05) (table 5).

PTA comparison between the two groups

After intervention, the PTA of both groups decreased, and the PTA of the observation group was

lower than that of the control group, the difference was statistically significant (P < 0.001). See figure 1 for details.

Discussion

Sudden deafness is often accompanied by symptoms such as tinnitus, dizziness, nausea and vomiting, large emotional fluctuations, and occasional ear blockage (10), which often lead to patients' excessive mental stress, irregular life and sleep disorders, and seriously affect their quality of life (11).At present, the clinical treatment of sudden deafness mainly includes the application of hormones, vitamins, anticoagulants, vasodilators, hyperbaric oxygen and other comprehensive treatments, among which hormone treatment of sudden deafness has been unanimously recognized by clinicians and patients (12-13).In this study, the patients with sudden deafness in our hospital were treated with high quality nursing combined with methylprednisolone intervention, and a significant therapeutic effect was achieved.

There are usually two kinds of hormone therapy: intravenous administration and oral administration. Because the local concentration of systemic steroid focus is low and it is easy to cause potential adverse drug reactions (14), and the drug concentration of intratympanic hormone injection is significantly higher than that of oral or intravenous hormone administration. Therefore, in recent years, the clinical application of intratympanic hormone therapy for sudden deafness is more and more extensive (15). The membrane of the cochlea window is mainly composed of the fibrous layer and the inner and outer layers of the upper cortex, which contains micro-vesicles, while the mitochondria and microvilli in the middle and outer layers can absorb substances and metabolize them (16). The endodermis has a basement membrane region, which provides conditions for proteins, electrolytes, peroxidase and other substances (17). Methylprednisolone is a drug synthesized from glucocorticoids, which has a strong anti-inflammatory effect and the function of regulating endocrine balance and nervous system. Glucocorticoids can rapidly diffuse in the body, penetrate the cell membrane, rapidly bind to specific receptors, and then enter the nucleus to bind to chromosomes, and then conduct mRNA transcription, and then synthesize various enzyme proteins, and finally act on the whole body (18). Finally, it acts on the whole body (18). Methylprednisolone can effectively treat inflammation, inhibit phagocytosis, reduce blood vessel dilation, and promote fat metabolism, protein metabolism and carbohydrate metabolism. The inhibitory effect of glucocorticoids on immune response is relatively strong, which can promote the microcirculation of the inner ear and reduce the hydroponysis of the labyrinth in patients (19). However, indoor injection of methylprednisolone is a kind of traumatic treatment with certain risks, so it should be used with caution. Quality nursing is a new patient-centered nursing model, which mainly provides comprehensive and whole-process targeted care to patients, especially in psychological and physiological aspects. If the patient has psychological and physiological needs, the nursing staff shall provide professional and personalized intervention strategies according to the individual patient, so as to satisfy the patient's psychological and physiological needs and help the patient to establish the confidence to overcome the disease (20-21).

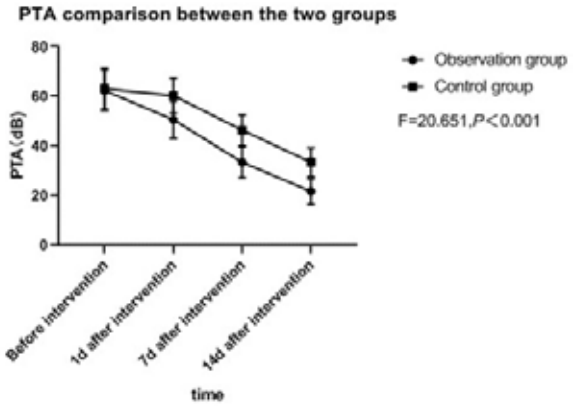

Figure 1. Comparison of PTA between the two groups

Conclusion

The results of this study show that the curative effect of the observation group is better than that of the control group. After the intervention, the SAS

and SDS scores of the two groups are reduced, and the observation group is significantly lower than the control group. After the intervention, the quality-of-life score of the observation group is higher than that of the control group. The nursing satisfaction of the observation group is significantly higher than that of the control group. After the intervention, the PTA of the two groups is decreased, and the PTA of the observation group is lower than that of the control group. Due to the small sample size of this study, there may be some bias in the results of this study, which needs to be further confirmed by a larger sample size.

Recommendation

It is indicated that high quality nursing combined with methylprednisolone has a good therapeutic effect in the treatment of sudden deafness. To sum up, high-quality nursing combined with methylprednisolone is effective in the treatment of sudden deafness, which can alleviate the negative emotions of patients, improve the quality of life and nursing satisfaction, and is worth promoting.

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