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功能性内窥镜鼻窦术对慢性鼻窦炎患者 TIgE、Eos 及鼻纤毛传输功能的影响 *

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摘要 目的:探讨功能性内窥镜鼻窦术对慢性鼻窦炎患者总免疫球蛋白(TIgE)、嗜酸性粒细胞(Eos)及鼻纤毛传输功能的影响。**方法:**选择 2015 年 12 月-2019 年 12 月在我院接受治疗的 120 例慢性鼻窦炎患者,采用抽签法将其分为观察组(n=61)和对照组(n=59)。对照组给予传统腺样体刮除术治疗,观察组给予功能性内窥镜鼻窦术治疗。比较两组患者的临床疗效、治疗前后血清 TIgE、Eos、白细胞介素 4(IL-4)、白细胞介素 8(IL-8)、肿瘤坏死因子(TNF- α)水平、鼻黏膜纤毛清除率、清除速度、传输速度的变化及并发症的发生情况。**结果:**治疗后,观察组的总有效率分别为 95.08%,明显高于对照组(77.97%, $P<0.05$)。治疗前,两组血清 TIgE、Eos 水平比较无明显差异;治疗后,两组血清 TIgE、Eos 水平均较治疗前显著降低,且观察组血清 TIgE、Eos 水平均低于对照组($P<0.05$)。治疗前,两组鼻黏膜纤毛清除率、清除速度、传输速度水平比较均无明显差异;治疗后,两组以上指标均显著升高,且观察组上述指标均高于对照组($P<0.05$)。治疗前,两组血清 IL-4、IL-8、TNF- α 水平无明显差异;治疗后,两组血清 IL-4、IL-8、TNF- α 水平均较治疗前显著降低,且观察组上述指标均显著低于对照组($P<0.05$)。两组并发症总发生率分别为 4.92%、20.34%,观察组显著低于对照组($P<0.05$)。**结论:**功能性内窥镜鼻窦术用于慢性鼻窦炎患者的临床效果显著优于传统腺样体刮除术治疗,且安全性更高,其可有效改善患者鼻纤毛传输功能,可能与其降低血清 TIgE、Eos 水平有关。

关键词:功能性内窥镜鼻窦术;慢性鼻窦炎;总免疫球蛋白;嗜酸性粒细胞;鼻纤毛传输功能

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Effect of Functional Endoscopic Sinus Surgery on theTige, EOS and Nasal CiliaTransport of Patients with Chronic Sinusitis*

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ABSTRACT Objective: To study The effect of functional endoscopic sinus surgery on Total immunoglobulin (TIgE), eosinophil (Eos) and nasal cilia transport in patients with chronic sinusitis. **Methods:** 120 patients with chronic sinusitis treated in our hospital from December 2015 to December 2019 were selected and divided into the observation group (n=61) and the control group (n=59) by lottery. The control group was treated with traditional adenoidectomy and the observation group was treated with functional endoscopic sinus surgery. The clinical efficacy, serum TIgE, Eos, interleukin-4 (IL-4), interleukin-8 (IL-8), tumor necrosis factor (TNF- α) levels, nasal mucociliary clearance rate, clearance rate, transmission rate and complications were compared between the two groups before and after treatment. **Results:** After treatment, the total effective rate of observation group was 95.08%, which was significantly higher than that of the control group (77.97%, $P<0.05$). Before treatment, there was no significant difference in the serum TIgE and Eos levels between the two groups. After treatment, the serum TIgE and Eos levels in both groups were significantly lower than those before treatment, which were lower than those in the control group ($P<0.05$). Before treatment, there was no significant difference in clearance rate, clearance speed and transmission speed between the two groups. After treatment, the above indexes in both groups were significantly increased, and those in the observation group were higher than those in the control group ($P<0.05$). Before treatment, there was no significant difference in the serum IL-4, IL-8 and TNF- α levels between the two groups. After treatment, the serum IL-4, IL-8 and TNF- α levels in both groups were significantly lower than those before treatment, and the above indicators in the observation group were significantly lower than those in the control group ($P<0.05$). The total incidence of complications in the two groups was 4.92% and 20.34%, respectively, which was significantly lower in the observation group than that of the control group ($P<0.05$). **Conclusion:** The clinical effect of functional endoscopic sinus surgery in patients with chronic sinusitis is significantly better than that of traditional adenoid curettage with higher safety. It can effectively improve the nasal ciliary transport function in patients, which may be related to the reduction of serum TIgE and Eos levels.

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前言

慢性鼻窦炎是耳鼻喉科常见疾病,主要由感染、空气污染和变应原刺激等多种因素所致,临床表现为鼻塞、头痛、嗅觉障碍等症状,其病因较为复杂,难以根治,严重影响患者的日常生活^[1,2]。手术是治疗该病的常用方式,但不同手术方案的效果不同。随着近年来内窥镜鼻窦术的不断发展,鼻内镜下切除治疗慢性鼻窦炎鼻息肉已被广泛运用于临床^[3]。功能性内窥镜鼻窦术可有效清除患者的病变组织,将鼻窦开口扩大,促进鼻窦解剖结构恢复正常,恢复鼻窦正常生理功能^[4]。TlgE 在健康人群中含量很低,在某些刺激下免疫球蛋白 E 水平增加,导致 TlgE 水平随之升高^[5];Eos 可释放活性物质,导致多种炎症因子被释放,损害纤毛输送系统,导致鼻窦里面分泌物储留及细菌滋生等,从而引起鼻窦黏膜炎症发生^[6,7]。两种指标均在慢性鼻窦炎中呈高表达,参与了疾病的发展,可作为治疗慢性鼻窦炎的重要指标,基于此,本研究主要探讨了功能性内窥镜鼻窦术治疗慢性鼻窦炎对 TlgE、Eos 及鼻纤毛传输功能的影响,结果报道如下。

1 资料与方法

1.1 一般资料

选择 2015 年 12 月 -2019 年 12 月在我院接受治疗的 120 例慢性鼻窦炎患者。采用抽签法分为 2 组,观察组 61 例:男 45 例,女 16 例,年龄 35-65 岁,平均(49.85±2.23)岁,病程 1.2~6.5 年,平均(3.58±0.35)年;对照组 59 例,男 41 例,女 18 例,年龄 34-66 岁,平均(50.13±2.28)岁,病程 1.1~6.7 年,平均(3.61±0.38)年。两组基线资料比较无明显差异,具有可比性。

诊断标准参照《慢性鼻-鼻窦炎诊断和治疗指南》^[8]:(1)嗅觉障碍,听力下降;(2)鼻道鼻甲腺水肿、有脓性分泌物;(3)咽干、头痛、嗅觉障碍等临床症状;(4)影像检查鼻腔黏膜充血;(5)下鼻甲不平、充血;(6)鼻镜检查下鼻甲后端肥大、黏膜肥厚。纳入标准:(1)符合上述诊断标准;(2)年龄>18 岁;(3)无明显药物过敏史;(4)近期未使用激素类药物者;(5)监护人知情且签署知

情同意书。排除标准:(1)严重肝肾疾病者;(2)患有意识障碍、精神障碍者;(3)伴有恶性肿瘤患者;(4)妊娠、围产、哺乳期妇女的患者;(5)严重脑血管疾病;(6)未按规定用药;(7)晕针者;(8)鼻腔结构性疾病者。

1.2 治疗方法

对照组给予传统腺样体刮除术:患者麻醉后,张口器撑开口咽部,压下舌体,刮匙置于腺样体的上端和后鼻孔的后端,吸引器吸除腺样体破碎组织,吸痰管从口鼻吸出活动性渗血,术后常规服用阿莫西林抗感染。观察组采用鼻内镜下腺样体切除术:麻醉后,打开病变处窦腔,矫正窦腔内变异结构,使用膨胀海绵填塞鼻腔,第二天在内窥镜的辅助下清除鼻腔分泌物,术后常规服用阿莫西林抗感染。

1.3 观察指标

采集空腹静脉血 5 mL,以 3000 r·min⁻¹ 的速度进行离心,时间 10 min,提取上层血清后,置于零下 20℃ 的冷冻箱内存储以备检测,采用双抗体夹心酶联免疫吸附法测定 TlgE、Eos、IL-4、IL-8、TNF-α 水平;记录鼻黏液纤毛清除率、鼻黏液纤毛清除速度、鼻黏膜纤毛传输速度;记录并发症发生情况。

疗效评定标准:显效:临床症状消失,鼻内镜检查良好,无脓性分泌物,窦腔黏膜上皮化;有效:临床症状明显改善,鼻内镜检查部分区域肉芽组织形成,少量脓性分泌物;无效:临床症状无改善。

1.4 统计学分析

以 spss18.0 软件包处理数据,符合正态分布的计量资料用均数±标准差($\bar{x} \pm s$)表示,组间比较使用独立样本 t 检验,计数资料以率表示,组间比较采用 χ^2 检验,以 $P < 0.05$ 表示差异具有统计学意义。

2 结果

2.1 两组临床疗效的比较

治疗后,两组总有效率分别为 95.08%,77.97%,观察组显著高于对照组($P < 0.05$),见表 1。

表 1 两组疗效的比较[n(%)]

Table 1 Comparison of the efficacy between the two groups[n(%)]

Groups	n	Excellent	Valid	Invalid	Total effective rate
Observation group	61	35(57.38)	23(37.70)	3(4.92)	58(95.08)
Control group	59	29(49.15)	17(28.81)	13(22.03)	46(77.97)
χ^2 value					7.603
P value					0.006

2.2 两组治疗前后 TlgE、Eos 水平的比较

治疗前,两组血清 TlgE、Eos 水平比较无明显差异;治疗后,两组血清 TlgE、Eos 水平均显著降低,且观察组上述指标均低于对照组($P < 0.05$),见表 2。

2.3 两组治疗前后鼻纤毛传输功能的比较

治疗前,两组鼻黏液纤毛清除率、清除速度、传输速度比较无明显差异;治疗后,两组鼻黏液纤毛清除率、清除速度、传输速度水平均显著升高,且观察组上述指标均高于对照组($P < 0.05$),见表 3。

05),见表3。

表2 两组治疗前后 TlgE、Eos 水平的比较($\bar{x}\pm s$)Table 2 Comparison of the TlgE and EOS levels between two groups before and after treatment ($\bar{x}\pm s$)

Groups	n	TlgE(kU/L)		Eos($\times 10^9/L$)	
		Before treatment	After treatment	Before treatment	After treatment
Observation group	61	85.23 $\pm$ 8.24	57.45 $\pm$ 6.97	0.25 $\pm$ 0.08	0.07 $\pm$ 0.03
Control group	59	85.19 $\pm$ 8.27	65.38 $\pm$ 7.12	0.24 $\pm$ 0.13	0.14 $\pm$ 0.05
T value		0.027	6.165	0.509	9.335
P value		0.979	0.000	0.611	0.000

表3 两组治疗前后鼻纤毛传输功能的比较($\bar{x}\pm s$)Table 3 Comparison of the nasal cilia transport function between the two groups before and after treatment ($\bar{x}\pm s$)

Groups	n	Nasal mucociliary clearance(%)		Nasal mucociliary clearance rate (mm/min)		Nasal mucociliary transport speed (mm/min)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	61	45.65 $\pm$ 4.04	79.63 $\pm$ 4.51	3.45 $\pm$ 0.31	8.95 $\pm$ 0.14	6.42 $\pm$ 0.18	11.25 $\pm$ 2.34
Control group	59	45.71 $\pm$ 3.97	70.13 $\pm$ 5.02	3.42 $\pm$ 0.29	6.15 $\pm$ 0.41	6.35 $\pm$ 0.23	8.67 $\pm$ 2.04
T value		0.082	10.913	0.547	50.393	1.860	6.429
P value		0.935	0.000	0.585	0.000	0.065	0.000

2.4 两组治疗前后血清 IL-4、IL-8、TNF- α 水平的比较

治疗前, 两组血清 IL-4、IL-8、TNF- α 水平比较无明显差

异; 治疗后, 两组血清 IL-4、IL-8、TNF- α 水平均显著降低, 且观察组上述指标均低于对照组($P<0.05$), 见表4。

表4 两组治疗前后血清 IL-4、IL-8、TNF- α 水平的比较($\bar{x}\pm s$)Table 4 Comparison of the serum IL-4, IL-8, TNF- α levels between the two groups before and after treatment ($\bar{x}\pm s$)

Groups	n	IL-4(ng/L)		IL-8(ng/L)		TNF- α (ng/mL)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Observation group	61	53.24 $\pm$ 16.21	34.25 $\pm$ 12.18	193.58 $\pm$ 36.82	101.25 $\pm$ 28.65	1.79 $\pm$ 0.45	0.74 $\pm$ 0.31
Control group	59	53.36 $\pm$ 17.05	45.56 $\pm$ 13.74	195.27 $\pm$ 37.15	132.25 $\pm$ 32.56	1.82 $\pm$ 0.43	1.25 $\pm$ 0.45
t value		0.039	4.775	0.250	5.542	0.373	7.250
P value		0.969	0.000	0.803	0.000	0.709	0.000

3 讨论

慢性鼻窦炎属于鼻窦黏膜与鼻腔部位慢性炎症, 为耳鼻咽喉科比较难治的疾病, 可发生在各个年龄段, 且反复发作, 症状至少持续3个月。该病发病率较高, 相关研究显示, 慢性鼻窦炎的发病率占慢性疾病的第8位, 严重影响患者的生活质量^[9,10]。慢性鼻窦炎的发病机制较为复杂, 研究认为与鼻腔上皮细胞屏障功能障碍、固有免疫功能紊乱等诸多因素有关^[11], 临床通常使用手术治疗该病。

近年来, 鼻内镜手术逐渐取代传统术式成为治疗慢性鼻窦炎的重要手段^[12,13]。功能性内窥镜鼻窦术可通过内窥镜精确判断手术位置, 且视野开阔, 创伤面积小, 最大限度保护鼻腔内结构免受破坏, 良好的恢复患者鼻腔与鼻窦基本功能, 缓解患者临床症状^[14,15]。内窥镜鼻窦术的发展是鼻科学的一大突破, 已扩展到鼻颅等相关疾病, Reddy E P^[16]等研究显示功能性内窥镜

鼻窦术摒弃了传统根治性大部刮除窦内黏膜的破坏性方式, 保留鼻腔、鼻窦正常结构, 达到借助鼻腔自身生理功能发挥治疗的目的。本研究结果显示采用功能性内窥镜鼻窦术治疗的患者总有效率为95.08%, 明显高于使用传统手术的患者, 且并发症发生率也低于对照组, 提示功能性内窥镜鼻窦术能提高慢性鼻窦炎的治疗效果, 且具有较高的安全性。研究显示功能性内窥镜鼻窦术可维持血液流变学的稳定, 减轻手术应激反应, 提高治疗效果^[17]。分析其原因可能是因为功能性内窥镜鼻窦术治疗慢性鼻窦炎可促进患者术腔上皮细胞恢复, 缩短上皮细胞完全时间, 还能减少对鼻腔结构的伤害, 保护鼻腔与鼻腔黏膜组织, 从而提高治疗效果。

有研究显示变态反应在慢性鼻窦炎的持续性过程中发挥重要作用, 慢性鼻窦炎伴有不同程度的变态反应, 该反应对手术存一定的不良影响, 影响治疗效果^[18,19]。血清 TlgE、Eos 是反映机体变态反应程度的指标, 其中 TlgE 半衰期短, 在正常机体

中含量较少,当受到某些刺激时,其含量增多,而慢性鼻窦炎患者血清 TlgE 水平显著高于正常人群^[20,21]。Eos 由 TH2 细胞产生,可释放毒性阳蛋白损伤上皮组织,加重炎症损伤,且其水平升高可导致组织肿胀,阻塞窦口,使得患者病情迁延难愈^[22,23]。本研究结果显示两组治疗后血清 TlgE、Eos 水平均显著降低,且使用功能性内窥镜鼻窦术治疗的患者上述指标均低于对照组,说明功能性内窥镜鼻窦术在慢性鼻窦炎的治疗中可降低机体变态反应状态。鼻黏膜具有过滤吸入气体颗粒的作用,能调节吸入气体温度与湿度,黏液纤毛传输功能在其中发挥着重要的作用。Nogami H^[24]等研究显示鼻内镜手术可通过调整内镜位置精准清除病变组织,减少鼻黏膜损伤,保护其结构与功能。本研究结果显示两组治疗后鼻黏膜纤毛清除率、清除速度、传输速度水平均显著升高,且使用功能性内窥镜鼻窦术治疗的患者上述指标均高于对照组,结果提示功能性内窥镜鼻窦术可通过减少患者变态反应提高纤毛输送系统功能,对患者病情恢复有益。分析其原因可能是因为功能性内窥镜鼻窦术视野更清晰,能彻底清除病灶组织,同时还能保留患者鼻腔内的正常组织结构,改善患者鼻黏膜纤毛清除功能。

慢性鼻窦炎患者鼻黏膜中伴有嗜酸性粒细胞浸润,导致炎性介质受到刺激而释放,形成较为严重的炎性反应,从而造成机体组织受损^[25-27]。有研究显示鼻窦炎的发生与真菌感染后机体的免疫应答有关,而嗜酸性粒细胞是其中的介导体,可促进粒细胞分泌多种炎症因子^[28,29]。IL-4 可提高炎症细胞浸润及活化;IL-8 在组织中聚集造成正常组织损伤,可诱导炎性细胞聚集,直接参与炎性反应;TNF- α 是一种初级炎症因子,可趋化中性粒细胞及浸润局部的作用,诱导包括自身在内的多种炎症因子,促进白细胞在炎症反应部位聚集、血管通透性增加等^[30-33]。IL-4、IL-8、TNF- α 是造成慢性鼻窦炎的重要炎症因子,且 TNF- α 水平上升会刺激淋巴细胞产生多种炎症因子,从而加剧炎性反应^[34]。本研究结果显示两组治疗后血清 IL-4、IL-8、TNF- α 水平均显著降低,且观察组上述指标均低于对照组,提示功能性内窥镜鼻窦术可抑制患者炎症反应。Chen J^[35]等研究也显示功能性内窥镜鼻窦术可通过降低患者机体的炎性反应提高治疗效果。

综上所述,功能性内窥镜鼻窦术用于慢性鼻窦炎患者的临床效果显著优于传统腺样体刮除术治疗,且安全性更高,其可有效改善患者鼻纤毛传输功能,可能与其降低血清 TlgE、Eos 水平有关。

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