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放射性核素 ^{131}I 在甲亢治疗中的安全性与有效性

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摘要 目的:探讨放射性核素 ^{131}I 应用于甲亢治疗的安全性及有效性。**方法:**选择 2013 年 8 月到 2016 年 2 月选择在我院诊治的甲亢患者 240 例,根据随机信封抽签原则分为观察组与对照组各 120 例,对照组口服丙硫氧嘧啶片治疗,观察组在对照组治疗的基础上给予放射性核素 ^{131}I 治疗,治疗观察 3 个月,记录治疗的安全性及有效性。**结果:**治疗后,观察组总有效率为 96.7%,明显高于对照组的 86.7%($P<0.05$)。观察组治疗后血清甲状腺激素水平明显低于治疗前及对照组($P<0.05$)。观察组治疗期间的甲减、粒细胞减少、肝脏损害、贫血等不良反应发生率为 11.7%,对照组为 10.8%,两组不良反应的发生率对比差异无统计学意义($P>0.05$)。**结论:**放射性核素 ^{131}I 可使甲亢患者的甲状腺激素的分泌和合成显著减少,安全性及有效性均较高。

关键词:放射性核素 ^{131}I ; 甲亢; 不良反应; 甲状腺激素

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Efficacy and Safety of Radionuclide ^{131}I in the Treatment of Hyperthyroidism

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ABSTRACT Objective: To explore the efficacy and safety of radionuclide ^{131}I in the treatment of hyperthyroidism. **Methods:** From August 2013 to February 2016, 240 cases of patients with hyperthyroidism in our hospital were selected and randomly divided into the observation group and control group with 120 cases of patients in each group. The control group was treated with propylthiouracil tablets, while the observation group was given radionuclide ^{131}I treatment based on the treatment of control group, all the patients were treated for 3 months, and the safety and efficacy were recorded. **Results:** The total effective rate of observation group and control group were 96.7% and 86.7% respectively, the total effective rate of observation group was significantly higher than that of the control group ($P<0.05$). After treatment, the serum levels of FT3 and FT4 in the observation group were significantly lower than those before treatment and those in the control group ($P<0.05$). The adverse reaction of observation group during the treatment included hypothyroidism, neutropenia, anemia, liver damage and the incidence rate was 11.7%, which was 10.8% in the control group, no significant difference was observed between two groups($P>0.05$). **Conclusion:** Radionuclide ^{131}I was safe and effective in the treatment of hyperthyroidism, which could reduce the secretion and synthesis of thyroid hormone.

Key words: Radionuclide ^{131}I ; Hyperthyroidism; Adverse reaction; Thyroid hormone

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前言

甲状腺功能亢进症(甲亢)是一种甲状腺功能增强性疾病,也是导致机体内各系统功能兴奋、机体代谢亢进的一种综合症,在人群中的患病率约为 1.5%^[1,2]。甲亢的种类比较复杂,包括 Graves 病、多结节性甲状腺肿伴甲亢、碘甲亢、垂体性甲亢、甲状腺自主性高功能腺瘤、绒毛膜促性腺激素(hCG)相关性甲

亢等^[3,4]。现代研究表明甲亢的发病机制可能是由于多种因素刺激促甲状腺激素(TSH)受体引起甲状腺激素生成和大量释放^[5,6]。目前,尚不能对甲亢进行病因治疗,普遍采用的治疗方法包括抗甲状腺药物治疗,主要药物为硫氧嘧啶、甲巯咪唑等,但是对于治疗依从性比较高,导致复发率比较高^[7,8]。放射性核素治疗是利用甲状腺摄取和浓集碘的能力以及 ^{131}I 释放时的生物学效应,破坏甲状腺滤泡上皮细胞从而减少甲状腺激素的分泌^[9,10]。本研究主要探讨了放射性核素 ^{131}I 应用于甲亢治疗的有效性和安全性,现报道如下。

1 资料与方法

1.1 对象

选择 2013 年 8 月到 2016 年 2 月于唐山市中医医院治疗

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的 240 例甲亢患者,纳入标准:符合甲亢的诊断标准;甲状腺弥漫性肿大;血清 TSH 浓度降低,甲状腺激素浓度升高;年龄 20-80 岁;获我院医院伦理委员会批准,并与患者签署知情同

意。排除标准:其他原因引起的继发性甲亢;合并其他免疫性疾病、感染性疾病等情况;合并精神疾病。随机分为观察组与对照组各 120 例,两组一般资料对比无明显差异($P>0.05$)。见表 1。

表 1 两组一般资料对比

Table 1 Comparison of the basic data between two groups

Groups	n	Gender (Male/Female)	Age (Year)	Course of disease (Year)	BMI (kg/m ²)
Observation group	120	65/55	56.33± 5.35	1.67± 0.55	25.13± 2.45
Control group	120	60/60	56.21± 4.44	1.87± 0.51	24.98± 3.11
P		>0.05	>0.05	>0.05	>0.05

1.2 治疗方法

对照组:口服丙硫氧嘧啶片(生产企业:上海朝晖药业有限公司,批准文号:国药准字 H31021082),100 mg/ 次,3 次 /d,连续治疗观察 3 个月。

观察组:在对照组治疗的基础上给予放射性核素 ¹³¹I 治疗,首次给予总量的 1/2-2/3,3-7 d 后补足总剂量,治疗观察 3 个月。总剂量计算公式为:甲状腺重量(g)× 每克甲状腺组织 ¹³¹I 剂量 /24 h 最高摄入 ¹³¹I 率(%)。

1.3 观察指标

(1)疗效标准:显效:甲亢症状消失,TSH、FT₄、FT₃ 水平恢复正常;有效:甲亢现象缓解,各项生化指标检测值好转;无效:未达到上述标准甚或恶化。以显效 + 有效计算总有效。(2)血清 FT₃、FT₄ 测定:所有患者在治疗前后采集空腹静脉血,以 3000

rpm 离心 15 min,分离血清,采用化学发光法测定 FT₃、FT₄ 的含量,试剂盒均为购自西门子医学诊断产品。(3)安全性:观察两组治疗期间不良反应(如甲减、粒细胞减少、肝脏损害、贫血等)发生情况。

1.4 统计学分析

使用 SPSS14.0 软件,计量数据以均数± 标准差表示,采用 t 检验;计数数据以%表示,采用 χ^2 检验,以 $P<0.05$ 为差异具有统计学意义。

2 结果

2.1 两组临床疗效的对比

治疗后,观察组总有效率为 96.7%,明显高于对照组($P<0.05$)。见表 2。

表 2 两组总有效率对比(例)

Table 2 Comparison of the total effective rate between two groups (n)

Groups	n	Remarkable effective	Effective	Ineffective	Total effective rate
Observation group	120	96	20	4	96.7%
Control group	120	64	40	16	86.7%
P					<0.05

2.2 两组治疗前后血清 FT₃ 和 FT₄ 水平的对比

治疗后,两组血清 FT₃ 和 FT₄ 水平均较治疗前明显降低,

且观察组血清 FT₃ 和 FT₄ 水平都明显低于对照组 ($P<0.05$)。见表 3。

表 3 两组治疗前后血清 FT₃ 和 FT₄ 水平对比(pmol/L, $\bar{x} \pm s$)Table 3 Comparison of the serum FT₃ and FT₄ levels before and after treatment between two groups (pmol/L, $\bar{x} \pm s$)

Groups	n	FT ₃			FT ₄		
		Before treatment	After treatment	P	Before treatment	After treatment	P
Observation group	120	24.29± 5.39	4.28± 1.49	<0.05	77.56± 11.42	13.48± 8.44	<0.05
Control group	120	24.11± 4.82	9.22± 2.22	<0.05	77.10± 10.94	29.14± 9.14	<0.05
P		>0.05	<0.05		>0.05	<0.05	

2.3 两组不良反应发生情况的对比

观察组治疗期间的甲减、粒细胞减少、肝脏损害、贫血等不

良反应发生率为 11.7%,对照组为 10.8%,两组不良反应的发生率比较差异无明显统计学意义($P>0.05$)。见表 4。

表 4 两组治疗期间不良反应发生情况对比(例)

Table 4 Comparison of the incidence of adverse reactions during treatment period between two groups (n)

Groups	n	Hypothyroidism	Granulocytopenia	Liver damage	Anemia	Total
Observation group	120	3	3	3	5	14(11.7%)
Control group	120	4	1	2	6	13(10.8%)
P						>0.05

3 讨论

甲亢是一种常见的自身免疫性疾病,临床主要表现为出汗、心悸、进食、排便次数增多等症状,甲亢时甲状腺有不同程度的肿大,合成和分泌甲状腺激素增加^[11,12]。随着我国实施全民食盐加碘,尤其在不缺碘的沿海地区,甲亢患病率可能进一步升高^[13]。有研究报道显示甲亢发病可能与诸多因素有关,其中免疫因素占有较为重要的作用^[14,15]。

甲亢有多种治疗方法,药物治疗以抑制甲状腺激素合成为主要作用机理,放射性核素 ¹³¹I 和手术治疗则是以破坏甲状腺组织,减少其分泌产生甲状腺激素^[16]。上述治疗各有利弊:药物治疗疗程较长,且需定期接受随访复查,对患者依从性要求较高,导致长期治疗效果不好;手术治疗虽然可以快速、有效的控制甲亢患者病情,但是创伤比较大^[17]。甲亢患者的甲状腺浓聚的碘化物含量极高,放射性核素 ¹³¹I 有效半衰期约为 3 d 左右,电离辐射可造成甲状腺滤泡上皮细胞破坏,减少甲状腺激素产生,达到治疗效果^[18]。本研究中观察组的总有效率明显高于对照组。也有研究表明 ¹³¹I 治疗可使部分甲状腺组织受到射线的集中照射,使亢进的甲状腺功能恢复正常,达到治疗的目的。

甲亢病理损伤是一种炎症反应,免疫调节网络失衡在甲亢病的发生、发展及转归中有重要作用。甲疏咪唑片可以通过抑制甲状腺过氧化物酶的活性来阻断集中在甲状腺的离子碘氧化成活性碘,抑制了 T₃、T₄ 的合成,使酪氨酸不易碘化,从而发挥抗甲状腺的作用^[19]。在 ¹³¹I 治疗中,射线可导致部分甲状腺滤泡细胞破裂,使得细胞内容物释放入血,作刺激机体产生免疫反应;且电离辐射损伤也会启动甲状腺内其它的免疫应答^[20,21]。本研究显示治疗后观察组 FT₃ 和 FT₄ 水平明显低于治疗前及对照组,表明放射性核素 ¹³¹I 的应用能通过对甲状腺中的碘有机化和氧化进行抑制以减少合成甲状腺素。此外,本研究也显示观察组治疗期间的甲减、粒细胞减少、肝脏损害、贫血等不良反应发生率为 11.7%,对照组为 10.8%,表明放射性核素 ¹³¹I 的应用具有很好的安全性。同时在治疗中应定期监测肝功能等生命体征,防止不良反应的发生。

总之,放射性核素 ¹³¹I 可使甲亢患者的甲状腺激素的分泌和合成显著减少,安全性及有效性均较高。

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