

doi: 10.13241/j.cnki.pmb.2018.21.031

连续全遮盖法治疗双眼屈光参差性弱视的有效性与安全性分析*

王琦¹ 郭长梅² 孙炜³ 王彦荣¹ 顾莉莉¹ 李梅¹ 张俊霞¹ 高凡^{1Δ}

(1 陕西省延安市人民医院眼科 陕西 延安 716000; 2 空军军医大学西京医院眼科 陕西 西安 710000;

3 中国医科大学附属第四医院眼科 辽宁 沈阳 110005)

摘要 目的:探讨连续q全遮盖法治疗双眼屈光参差性弱视的有效性与安全性。**方法:**选择2014年2月到2016年9月在我院诊治的126例双眼屈光参差性弱视患儿作为研究对象,根据治疗方法的不同分为阿托品组60例与遮盖组66例,遮盖组采用连续全遮盖法治疗,阿托品组给予阿托品治疗,两组都治疗观察3个月。比较两组治疗期间不良反应的发生情况、治疗后的总有效率、最佳矫正视力、电位潜伏期、波幅。**结果:**两组治疗期间都无严重不良反应发生。治疗后,遮盖组与阿托品组的总有效率分别为98.5%和88.3%,遮盖组的总有效率明显高于阿托品组($P<0.05$)。两组治疗后的最佳矫正视力都高于治疗前,且遮盖组治疗后的最佳矫正视力也明显高于阿托品组($P<0.05$)。两组治疗后的电位潜伏期都较治疗前明显缩短,而波幅明显增强($P<0.05$),且遮盖组治疗后的潜伏期明显短于阿托品组,而波幅显著强于阿托品组($P<0.05$)。**结论:**连续全遮盖法治疗双眼屈光参差性弱视具有很好的安全性,能提高患儿的治疗效果,改善视力,促进神经元的兴奋性。

关键词: 双眼屈光参差性弱视;连续全遮盖法;阿托品;安全性;有效性

中图分类号: R777.4 **文献标识码:** A **文章编号:** 1673-6273(2018)21-4137-04

Efficacy and Safety of Continuous Occlusion in the Treatment of Binocular Refractive Aberration*

WANG Qi¹, GUO Chang-me², SUN Wei³, WANG Yan-rong¹, GU Li-li¹, LI Mei¹, ZHANG Jun-xia¹, GAO Fan^{1Δ}

(1 Ophthalmology Department, Yanan People's Hospital, Yan'an, Shaanxi, 716000, China;

2 Ophthalmology Department, Air Force Military Medical University Xijing Hospital, Xi'an, Shaanxi, 710000, China;

3 Ophthalmology Department, Fourth Affiliated Hospital of China Medical University, Shenyang, Liaoning, 110005, China)

ABSTRACT Objective: To investigate the efficacy and safety of continuous full occlusion in the treatment of binocular refractive aberration. **Methods:** From February 2014 to September 2016, 126 cases of binocular refractive aberration in children in our hospital were selected as the research object, all the cases were divided into 60 cases of occlusion and 66 cases of atropine group by different treatment methods. The occlusion group was given the continuous full covering law treatment, the atropine group was given atropine treatment, the treatment cycles in the two groups were 3 months. The incidence of serious adverse reactions during treatment, total effective rate, best corrected visual acuity, latency and amplitude were compared between two groups. **Results:** There was no serious adverse reaction in the two groups during treatment. The total effective rate of treatment group and the atropine group was 98.5% and 88.3% respectively, and the total effective rate of treatment group was significantly higher than that of the atropine group ($P<0.05$). The best corrected visual acuity of both groups were higher than those before treatment, which was significantly higher in the treatment group than that of atropine group ($P<0.05$). The latency of both groups after treatment were significantly shorter than those before treatment, and the amplitude were significantly enhanced, and the latency of treatment group was significantly shorter in the treatment group than that of atropine group ($P<0.05$), while the amplitude was statistically higher ($P<0.05$). **Conclusions:** Continuous occlusion is a good method to improve the therapeutic effect in the treatment of binocular refractive aberration, it can improve the visual acuity and promote the excitability of neurons.

Key words: Binocular refractive aberration; Continuous occlusion; Atropine; Safety; Efficacy

Chinese Library Classification(CLC): R777.4 **Document code:** A

Article ID: 1673-6273(2018)21-4137-04

前言

随着现代生活的发展,我国双眼屈光参差性弱视的发病人

数越来越多,特别是青少年比较多见^[1]。流行病学调查显示约有50%的青少年患有不同程度的屈光不正性弱视^[2,3]。双眼屈光参差性弱视患儿往往缺乏双眼视功能,严重影响青少年成长后的

* 基金项目:辽宁省教育厅一般项目(lr201602)

作者简介:王琦(1979-),男,硕士研究生,副主任医师,研究方向:小儿眼科、斜弱视, E-mail: wangqi_1979@papmedhos.com

Δ 通讯作者:高凡(1987-),女,硕士研究生,主治医师,研究方向:眼屈光, E-mail: gaofan_19@papmedhos.com

(收稿日期:2018-02-03 接受日期:2018-02-28)

生活质量^[4]。弱视是由于视觉系统发育的关键期进入患眼内的视觉刺激不够充分,剥夺了形成物像的机会,从而使双眼视功能不完善^[5,6]。

当前,弱视的治疗方法有遮盖法、视刺激法、后像法、压抑法、红色滤光片法等^[7,8]。其中,阿托品扩瞳法是比较常见的药物压抑法,只需用阿托品涂注视眼,治疗方法比较简单,但是持续效果一直不太好^[9]。遮盖法是传统的弱视治疗方法,能促使屈光状态和眼轴长度达到合适的匹配,但是具体的应用效果与安全性还不完全明确^[10]。本研究主要探讨了连续全遮盖法治疗双眼屈光参差性弱视的有效性,现报道如下。

1 临床资料

1.1 研究对象

选择 2014 年 2 月到 2016 年 9 月选择在我院诊治的 126 例双眼屈光参差性弱视患儿作为研究对象,纳入标准:符合双眼屈光参差性弱视的诊断标准;年龄 3-12 岁;弱视眼为远视且双眼屈光度球镜相差 ≥ 1.50 DS 或柱镜度数 ≥ 1.00 DC;患儿家长知情同意本研究。排除标准:合并先天性心肝肾异常患儿。根据治疗方法的不同随机分为阿托品组 60 例与遮盖组 66 例,两组患儿的性别、年龄、弱视程度、球镜度数等对比无统计学意义($P>0.05$)。见表 1。

表 1 两组一般资料的对比

Table 1 Comparison of the general data between two groups

Groups	Cases(n)	Male/Female	Age(Years)	amblyopia Degree (Light/middle/Severe)	dioptr of spherical power(OD)
Cover Group	66	36/30	6.33 $\pm$ 1.94	26/20/20	+5.00 $\pm$ 0.56
Atropine group	60	32/28	6.29 $\pm$ 2.11	21/19/20	+5.21 $\pm$ 0.45
P		>0.05	>0.05	>0.05	>0.05

1.2 治疗方法

遮盖组:采用连续全遮盖法治疗,选择采用眼贴或眼罩遮盖主导眼,强迫弱视眼注视,每日至少连续遮盖 4 h。阿托品组:给予阿托品治疗,每晚睡前将 1%阿托品眼膏涂于主导眼下睑结膜囊内。两组都治疗观察 6 个月。

1.3 观察指标

(1)疗效评价标准:基本痊愈:最佳矫正视力提高至 0.9 或以上,进步:视力提高 2 行或以上,无效:无达到上述标准甚或恶化。总有效率(%)=(痊愈例数+进步例数)/总例数 $\times 100\%$ 。(2)视力定量判定:在治疗前后均采用同一标准对数视力表在相同条件下进行矫正视力的检查,双眼分别检查,测定三次取平均值。(3)视觉诱发电位(P-VEP)检查:在治疗前后分别做全视野 P-VEP 检查(15'),主要观察指标为 P100 波波峰潜伏期、P100 波

波幅大小。

1.4 统计学分析

所有数据均使用 SPSS20.00 统计软件进行分析处理,经正态性检验均符合正态分布的计量资料用均数 $\pm$ 标准差($\bar{x} \pm s$)表示,计数数据采用率与百分比表示,分别采用 t 检验与卡方分析等,以 $P<0.05$ 为差异具有统计学意义。

2 结果

2.1 两组治疗总有效率的对比

两组在治疗期间都无严重不良反应发生。治疗后,遮盖组与阿托品组的总有效率分别为 98.5%和 88.3%,遮盖组的总有效率明显高于阿托品组($P<0.05$)。见表 2。

表 2 两组治疗总有效率的对比

Table 2 Comparison of the total Efficacy between two groups

Groups	Cases(n)	Recovery	Progress	Invalid	Total Efficacy
Cover Group	66	56	9	1	98.5%
Atropine group	60	40	13	7	88.3%
P					<0.05

2.2 两组治疗前后视力变化对比

遮盖组与阿托品组治疗后的最佳矫正视力都高于治疗前,

遮盖组治疗后的最佳矫正视力也明显高于阿托品组($P<0.05$),见表 3。

表 3 两组治疗后最佳矫正视力对比(均数 $\pm$ 标准差)

Table 3 Comparison of the best corrected visual contrast between two groups before and after treatment($\bar{x} \pm s$)

Groups	Cases (n)	Before treatment	After treatment	P
Cover Group	66	0.41 $\pm$ 0.03	0.92 $\pm$ 0.12	<0.05
Atropine group	60	0.41 $\pm$ 0.05	0.75 $\pm$ 0.13	<0.05
P		>0.05	<0.05	

2.3 两组治疗前后诱发电位变化的对比

两组治疗后的电位潜伏期都较治疗前明显缩短,而波幅明

显增强($P<0.05$),且治疗后遮盖组的潜伏期、波幅值与阿托品组对比差异也有统计学意义($P<0.05$)。见表4。

表4 两组治疗前后诱发电位的变化对比(均数 $\pm$ 标准差)

Table 4 Comparison of the changes of evoked potentials between two groups before and after treatment($\bar{x}\pm s$)

Groups	Cases (n)	Incubation period (ms)		Amplitude (μV)	
		Before treatment	After treatment	Before treatment	After treatment
Cover Group	66	108.34 $\pm$ 22.87	93.46 $\pm$ 5.28 [^]	10.98 $\pm$ 5.43	17.31 $\pm$ 4.98 [^]
Atropine group	60	108.37 $\pm$ 21.33	98.42 $\pm$ 3.17 [^]	11.00 $\pm$ 4.29	12.15 $\pm$ 3.59 [^]
P		>0.05	<0.05	>0.05	<0.05

3 讨论

双眼屈光参差性弱视是一种严重影响儿童视觉发育的常见眼病,若不及时治疗可造成患儿双眼视觉终身残疾和缺乏完善的立体视^[1]。从发病机制上分析,外界的视觉刺激对眼球的生长发育发挥精确的调控作用,在高度协调的方式下引导着小儿的眼睛向理想的屈光状态生长,而视觉发育关键期内的异常视觉经验可干扰正常的正视化过程,形成弱视^[12,13]。研究显示3-12岁是视力发育敏感期,这一阶段的视觉环境对视觉系统的发育影响很大,也是弱视治疗的最佳年龄段^[14,15]。

阿托品治疗双眼屈光参差性弱视在早期应用比较多见,其能使得患儿免去了戴眼罩的外观影响,治疗更加方便。但阿托品治疗实施过程中存在着一定的全身毒性反应,比如皮肤、粘膜干燥、发热、激动等^[16]。连续全遮盖疗法是治疗弱视最主要及沿用最久的方法,通过遮盖,暂时压抑主导眼,给弱视眼更多的使用机会,助于调整和建立双眼正常视网膜对应,逐步恢复双眼单视功能^[17,18]。本研究显示遮盖组与阿托品组治疗后的总有效率分别为98.5%和88.3%,遮盖组的总有效率明显高于阿托品组,且遮盖组的最佳矫正视力也明显高于阿托品组。这些结果提示连续全遮盖疗法用于眼屈光参差性弱视的效果明显优于阿托品治疗,其原因主要在于连续全遮盖疗法以适当的良性视觉刺激,减轻或消除来自主导眼对弱视眼长期存在的抑制,使之再兴奋起来,从而提高视力^[19-23]。

人眼的屈光度是一个发育和变化过程,由生理性远视到正视化甚至轻度近视的过程中。随着年龄增长和眼球发育,双眼屈光参差性弱视患儿眼轴变长和远视度数逐渐降低,难以获得较好的矫正视力^[24,25]。P-VEP反映了弱视对中枢功能的影响,也能反映弱视患儿视觉的可塑性。遮盖疗法已有近300年的历史,能增加弱视眼的使用机会,从而提高弱视眼视力^[26-28]。本研究显示遮盖组治疗后的潜伏期明显短于阿托品组,而波幅显著强于阿托品组,说明连续全遮盖疗法的应用有助于减轻患儿的屈光度,可能与连续全遮盖法可改善神经元的兴奋性有关^[29,30]。

总之,连续全遮盖法治疗双眼屈光参差性弱视具有很好的安全性,能提高患儿的治疗效果,改善视力,促进神经元的兴奋性。

参考文献(References)

- [1] Ahn Y J, Choi S I, Yum H R, et al. Clinical features in children with posterior polymorphous corneal dystrophy [J]. *Optom Vis Sci*, 2017, 94(4): 476-481
- [2] Qi S, Mu Y F, Cui L B, et al. Association of optic radiation integrity

with cortical thickness in children with anisometropic amblyopia[J]. *Neuroscience Bulletin*, 2016, 32(1): 51-60

- [3] Bretas C C, Soriano R N. Amblyopia: neural basis and therapeutic approaches[J]. *Arq Bras Oftalmol*, 2016, 79(5): 346-351
- [4] Drews B C, Cotsonis G, Celano M, et al. Assessment of adherence to visual correction and occlusion therapy in the infant aphakia treatment study[J]. *Contemp Clin Trials Commun*, 2016, 15(3): 158-166
- [5] Dadeya S, Dangda S. Television video games in the treatment of amblyopia in children aged 4-7 years [J]. *Strabismus*, 2016, 24(4): 146-152
- [6] Gupta M, Rana S K, Mittal S K, et al. Profile of amblyopia in school going (5-15 years) children at state level referral hospital in Uttarakhand [J]. *Journal of Clinical & Diagnostic Research Jcdr*, 2016, 10(11): SC09-SC11
- [7] Wallace M P, Stewart C E, Moseley M J, et al. Treatment of amblyopia using personalized dosing strategies: statistical modelling and clinical implementation[J]. *Strabismus*, 2016, 24(4): 161-168
- [8] Miyata M, Nakahara R, Hamasaki I, et al. Quantitative analysis of the effects of a bangerter filter on gross stereopsis in experimental models of reduced visual acuity[J]. *Acta Med Okayama*, 2016, 70(5): 339-344
- [9] Birch E E, Morale S E, Jost R M, et al. Assessing suppression in amblyopic children with a dichoptic eye chart [J]. *Investigative Ophthalmology & Visual Science*, 2016, 57(13): 5649-5654
- [10] Öner V, Bulut A. Does the treatment of amblyopia normalise subfoveal choroidal thickness in amblyopic children? [J]. *Clin Exp Optom*, 2017, 100(2): 184-188
- [11] Maconachie G D, Farooq S, Bush G, et al. Association between adherence to glasses wearing during amblyopia treatment and improvement in visual acuity[J]. *JAMA Ophthalmol*, 2016, 134(12): 1347-1353
- [12] Piano M E, Bex P J, Simmers A J. Perceived visual distortions in juvenile amblyopes during/following routine amblyopia treatment [J]. *Invest Ophthalmol Vis Sci*, 2016, 57(10): 4045-4054
- [13] Autrata R, Krejčířová I, Grisčířková L, et al. Refractive Surgery in Children with Myopic Anisometropia and Amblyopia in Comparison with Conventional Treatment by Contact Lenses [J]. *Cesk Slov Oftalmol*, 2016, 72(2): 12-19
- [14] Tjiam A M, Asjes T W L, Holtslag G, et al. Implementation of an educational cartoon ("the Patchbook") and other compliance-enhancing measures by orthoptists in occlusion treatment of amblyopia [J]. *Strabismus*, 2016, 24(3): 120-135
- [15] Nishi T, Ueda T, Mizusawa Y, et al. Choroidal structure in children

- with anisohypermetropic amblyopia determined by binarization of optical coherence tomographic images [J]. Plos One, 2016, 11 (12): e0168826
- [16] Wang J, Neely D E, Galli J, et al. A pilot randomized clinical trial of intermittent occlusion therapy liquid crystal glasses versus traditional patching for treatment of moderate unilateral amblyopia[J]. J AAPOS, 2016, 20(4): 326-331
- [17] Ramkumar V A, Agarkar S, Mukherjee B. Nasolacrimal duct obstruction: Does it really increase the risk of amblyopia in children?[J]. Indian Journal of Ophthalmology, 2016, 64(7): 496-499
- [18] O'Boyle C, Chen S I, Little J A. Crowded letter and crowded picture logMAR acuity in children with amblyopia: a quantitative comparison[J]. Br J Ophthalmol, 2017, 101(4): 457-461
- [19] Wang Q, Huang S, Jing L I. New developments of combined treatment of Chinese and Western medicine and nursing interventions for amblyopia in children[J]. China Medical Herald, 2016, 35(11): 629
- [20] Kehrein S, Kohnen T, Fronius M. Dynamics of interocular suppression in amblyopic children during electronically monitored occlusion therapy: first insight[J]. Strabismus, 2016, 24(2): 51-62
- [21] Dadeya S, Dangda S. Television video games in the treatment of amblyopia in children aged 4-7 years[J]. Strabismus, 2016, 24(4): 146-152
- [22] Sachdeva V, Mittal V, Gupta V, et al. "Combined Occlusion and Atropine Therapy" Versus "Augmented Part-Time Patching" in Children with Refractory/Residual Amblyopia: A Pilot Study [J]. Middle East Afr J Ophthalmol, 2016, 23(2): 201-207
- [23] Wang J, Racette L, Ott P, et al. Objectively-measured compliance to atropine penalization treatment in children with amblyopia: a pilot study[J]. Eye Science, 2016, 31(3): 146-152
- [24] Wang J. Compliance and patching and atropine amblyopia treatments [J]. Vision Research, 2015, 114(3): 31-40
- [25] Herbison N, Mackeith D, Vivian A, et al. Randomised controlled trial of video clips and interactive games to improve vision in children with amblyopia using the I-BiT system [J]. Br J Ophthalmol, 2016, 100(11): 1511-1516
- [26] Gupta M, Rana S K, Mittal S K, et al. Profile of Amblyopia in School going (5-15 years) Children at State Level Referral Hospital in Uttarakhand [J]. Journal of Clinical & Diagnostic Research Jcdr, 2016, 10(11): SC09-SC11
- [27] Antonios R, Arba M S, Awwad S T. Hyperopic laser in situ keratomileusis: comparison of femtosecond laser and mechanical microkeratome flap creation [J]. Journal of Cataract & Refractive Surgery, 2015, 41(8): 1602-1609
- [28] Choi S K, Chang J W. Higher Order Aberration and Astigmatism in Children with Hyperopic Amblyopia [J]. Korean Journal of Ophthalmology Kjo, 2016, 30(1): 53-59
- [29] Lin P W, Chang H W, Lai I C, et al. Visual outcomes after spectacles treatment in children with bilateral high refractive amblyopia[J]. Clinical & Experimental Optometry, 2016, 99(6): 550-554
- [30] Qi S, Mu Y F, Cui L B, et al. Association of Optic Radiation Integrity with Cortical Thickness in Children with Anisometropic Amblyopia [J]. Neuroscience Bulletin, 2016, 32(1): 51-60

(上接第 4182 页)

- [51] Watahiki A, Wang Y, Morris J, et al. MicroRNAs associated with metastatic prostate cancer[J]. PLoS One, 2011, 6(9): e24950
- [52] Akamatsu S, Wyatt AW, Lin D, et al. The Placental Gene PEG10 Promotes Progression of Neuroendocrine Prostate Cancer [J]. Cell Rep, 2015, 12(6): 922-936
- [53] Malaney P, Nicosia SV, Dave V. One mouse, one patient paradigm: New avatars of personalized cancer therapy[J]. Cancer Lett, 2014, 344 (1): 1-12
- [54] Gao H, Korn JM, Ferretti S, et al. High-throughput screening using patient-derived tumor xenografts to predict clinical trial drug response [J]. Nat Med, 2015, 21(11): 1318-1325
- [55] Hidalgo M, Bruckheimer E, Rajeshkumar NV, et al. A pilot clinical study of treatment guided by personalized tumorgrafts in patients with advanced cancer[J]. Mol Cancer Ther, 2011, 10(8): 1311-1316
- [56] Garralda E, Paz K, Lopez-Casas PP, et al. Integrated next-generation sequencing and avatar mouse models for personalized cancer treatment[J]. Clin Cancer Res, 2014, 20(9): 2476-2484
- [57] Lapointe J, Li C, Higgins JP, et al. Gene expression profiling identifies clinically relevant subtypes of prostate cancer [J]. Proc Natl Acad Sci U S A, 2004, 101(3): 811-816
- [58] Latil A, Bieche I, Chene L, et al. Gene expression profiling in clinically localized prostate cancer: a four-gene expression model predicts clinical behavior[J]. Clin Cancer Res, 2003, 9(15): 5477-5485
- [59] Frampton GM, Fichtenholtz A, Otto GA, et al. Development and validation of a clinical cancer genomic profiling test based on massively parallel DNA sequencing [J]. Nat Biotechnol, 2013, 31 (11): 1023-1031
- [60] Grasso CS, Cani AK, Hovelson DH, et al. Integrative molecular profiling of routine clinical prostate cancer specimens [J]. Ann Oncol, 2015, 26(6): 1110-1118
- [61] Miyamoto DT, Zheng Y, Wittner BS, et al. RNA-Seq of single prostate CTCs implicates noncanonical Wnt signaling in antiandrogen resistance[J]. Science, 2015, 349(6254): 1351-1356
- [62] Azad AA, Volik SV, Wyatt AW, et al. Androgen Receptor Gene Aberrations in Circulating Cell-Free DNA: Biomarkers of Therapeutic Resistance in Castration-Resistant Prostate Cancer[J]. Clin Cancer Res, 2015, 21(10): 2315-2324
- [63] Collins CC, Volik SV, Lapuk AV, et al. Next generation sequencing of prostate cancer from a patient identifies a deficiency of methylthioadenosine phosphorylase, an exploitable tumor target [J]. Mol Cancer Ther, 2012, 11(3): 775-783
- [64] Gao D, Vela I, Sboner A, et al. Organoid cultures derived from patients with advanced prostate cancer[J]. Cell, 2014, 159(1): 176-187