

Factors influencing amblyopia rehabilitation in occlusive therapy



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Introduction

Amblyopia develops in an early period and is a decrease of visual acuity (unilateral or bilateral) caused by a deprivation of vision or abnormal binocular interaction.

Prognosis of Amblyopia is better when occlusive treatment is implemented in an early stage.

Visual acuity of amblyopic eye does not improve without effective occlusive therapy.

The aim of this study is to identify potential risk factors of non-compliance with treatment when it is implemented by parents in amblyopic children.

Methods

A quantitative transversal study was performed in a public hospital and in a private clinic in Lisbon. Parents of functional amblyopic children (n=100) were asked to participate and fill a questionnaire based on Roger's Protection Motivation Theory between 3 to 31 of January of 2007.

Cronbach Alpha was used to evaluate internal consistency of the questionnaire [1st Section ($\alpha = 0,6325$); 2nd Section ($\alpha = 0,8825$); 3rd Section ($\alpha = 0,7721$); 4th Section ($\alpha = 0,8171$); 5th Section ($\alpha = 0,8847$)].

A logistic binary model was adjusted using the following variables: severity, vulnerability, self-efficacy, behaviour intentions, perceived efficacy and response costs or treatment barriers, parent and children age, and parents' qualifications. Clinical data, including visual acuity and self-report accounts of parents, was used as a measure of compliance.

Results

The mean age of the parents was 38,9±9,24. The mother was the most frequent participant with a percentage of 71%. 63% of Parents had basic education condition. The children had a mean age of 6,3±2,39, with 51% of masculine gender and 49% of feminine gender. At all the children were prescribed spectacles.

Compliance with eye patching revealed that 72% of parents were achieving orthoptist recommendations to patch their child. In 28% of cases visual acuity didn't raise any line. There is a positive mild correlation ($\kappa = 0,536$) between the Orthoptist's recommendations and parental perception of these recommendations. The logistic binary model was used to estimate the odds ratio for each factor. The criteria enter was used to select the variables for the model. The parameters significance was tested with the Wald test.

Conclusions

Parents play an essential role in compliance with patching. The present findings enhance that parent awareness of treatment barriers with occlusive therapy is a risk factor that increases non-compliance what is consistent with previous published scientific work.

The regressed variable treatment barriers is a significant risk factor for non compliance with patching what means that it is negatively associated with compliance.

Parents with low levels of education have more difficulties in treatment implementation. Interaction between severity and vulnerability was also identified as a non-compliance risk factor.

Further studies should be conducted to support these findings.

Let us consider Y as response variable (Compliance, 0 – compliance; 1 – non-compliance) and $\mathbf{X}'=[X_1 \ X_2 \ \dots \ X_{12} \ X_{13} \times X_7 \ X_{14} \times X_2 \ X_{15} \times X_6]$ the vector of regressor variables. The aim is to estimate the probability of the variable Y taking the value i (i = 0, 1) conditional on the vector X, ie

$$P(Y=i|\mathbf{X})$$

The link function of the multinomial logistic regression model is given by the equation:

$$g(\mathbf{X}) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_{12} X_{12} + \beta_{13} X_3 X_7 + \beta_{14} X_1 X_2 + \beta_{15} X_5 X_6$$

being
$$\pi(\mathbf{X}) = P(Y=i|\mathbf{X}) = \frac{e^{g(\mathbf{X})}}{1 + e^{g(\mathbf{X})}}$$

According to the results presented in table and at a 5% significance level, 3 risk factors for non compliance with patching were identified: treatment barriers, the variable related with parental stress perception with patching (OR=2,749), parents' basic education condition (OR=9,282) and the interaction between severity and vulnerability (OR=3,636). Severity (OR=0,007) and vulnerability (OR=0,062) when considered isolated were identified as protect factors that promote compliance with treatment.

| | B | S.E. | Wald | df | Sig. | Exp(B) | 95,0% C.I. for EXP(B) | |
|--|--------|-------|-------|----|------|---------|-----------------------|--------|
| | | | | | | | Lower | Upper |
| Severity | -5,028 | 2,394 | 4,411 | 1 | ,036 | ,007 | ,000 | ,715 |
| Vulnerability | -2,776 | 1,263 | 4,836 | 1 | ,028 | ,062 | ,005 | ,739 |
| Perceived efficacy | -1,916 | 1,906 | 1,010 | 1 | ,315 | ,147 | ,004 | 6,169 |
| Treatment barriers | 1,011 | ,415 | 5,937 | 1 | ,015 | 2,749 | 1,219 | 6,199 |
| Limitations | 1,626 | 1,465 | 1,232 | 1 | ,267 | 5,082 | ,288 | 89,712 |
| Stigma | ,479 | ,666 | ,517 | 1 | ,472 | 1,615 | ,438 | 5,858 |
| Self-efficacy | -,803 | 1,189 | ,456 | 1 | ,500 | ,448 | ,044 | 4,604 |
| Behaviour intentions | ,588 | 1,114 | ,279 | 1 | ,597 | 1,801 | ,203 | 15,980 |
| Parents age | -,027 | ,036 | ,546 | 1 | ,460 | ,974 | ,907 | 1,045 |
| Children age | ,033 | ,114 | ,085 | 1 | ,770 | 1,034 | ,826 | 1,294 |
| Parents education | | | 5,259 | 2 | ,072 | | | |
| Parents basic education condition (1) | 2,228 | ,996 | 5,002 | 1 | ,025 | 9,282 | 1,317 | 65,412 |
| Parents superior education condition (2) | ,355 | ,638 | ,309 | 1 | ,578 | 1,426 | ,408 | 4,977 |
| Perceived efficacy * self-efficacy | ,832 | ,846 | ,966 | 1 | ,326 | 2,297 | ,437 | 12,066 |
| Severity*vulnerability | 1,291 | ,562 | 5,277 | 1 | ,022 | 3,636 | 1,209 | 10,936 |
| Limitations*stigma | -,514 | ,443 | 1,347 | 1 | ,246 | ,598 | ,251 | 1,425 |
| Constant | 6,131 | 7,277 | ,710 | 1 | ,399 | 460,048 | | |

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