DOI: 10.4025/cienccuidsaude.v13i4.16739

PROFILE OF HUMAN ANTI-RABIES PROPHYLACTIC TREATMENT IN SOUTHERN BRAZIL

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ABSTRACT
The present study aimed to analyze the profile of anti-rabies prophylactic treatment of children and adolescents aged between zero and 15 years old, in the city of Maringá, state of Paraná, Brazil. Data were collected on the Brazilian Notification Aggravation Information System (SINAN) from January to December 2010. Simple and absolute frequencies were performed for categorical variables, and, for associations of interest, univariate analyzes were carried out through Pearson's chi-square test, with confidence interval of 95% and level of confidence set at <0.05 for all analyzes. Among all 311 care services performed, 101 involved anti-rabies care records of children and adolescents. Regarding treatment prescriptions, out of 101, 37 (36.6%) were made to subjects aged between 0 and 10 years old, and 64 (63.4%) to those aged ≥ 10 and < 15 years old. The treatment prescribed presented statistically significant association with age (p= 0.0288). There is a need for an educative work with children, parents and the general population, toward raising their awareness on the risks and seriousness of rabies, besides the update of and attention to the therapeutic method employed by health professionals.

Keywords: Anti-rabies vaccines. Rabies virus. Health assessment.

INTRODUCTION

Rabies is acute viral encephalitis transmitted by mammals, with two main transmission cycles: urban and natural. Epidemiologically, it is given the highest importance for being 100% lethal. It is a disease that can be eliminated in its urban cycle, for presenting efficient prevention measures regarding humans and the source of infection[1].

In urban environment, the main animal transmitter of the rabies virus is the dog, in 85% of the cases[2], followed by the cat. In rural areas, besides dogs and cats, other domestic animals in the epidemiological chain are also important, such as equines, bovines, swines, ovines, in addition to wild animals like bats, collared peccaries, skunks and monkeys[3].

Agitation, irreverence and a happy nature are common characteristics of many healthy dogs, being some of the greatest satisfactions for their owners, especially children, in which case dogs become privileged and inseparable game partners[4].

Human rabies is prevented through anti-rabies prophylactic treatment when there is the suspicion of exposure to the virus (post-exposure category). After aggression by an animal, a complete anamnesis has to be performed, with the use of human anti-rabies care records (S), in order to obtain all information about the case and refer the individual to a service that will carry out the prophylaxis (reference center, emergency, hospital, etc.), when the local Basic Health Unit (BHU) does not have serum and/or vaccine[1].

The prophylactic scheme for human rabies will depend on the conditions of the animal in the moment of the aggression and on the type of exposure the person has suffered (indirect contact, slight or serious accident). Therefore, after evaluation, the option will be to administer only the vaccine, and the quantity of doses will

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depend on the type of the accident, or, it might be necessary to administer the vaccine and anti-rabies serum[5]. The World Health Organization[6] reports the performance of more than 15 million post-exposure prophylaxes (PEP) and progressive increase in the number of care services throughout the last years. Studies refer growth in economic expenses with said prophylaxis, without the corresponding decrease in the number of cases of human rabies[7,8].

The vaccine, currently used in Brazil, is the cell-culture type. It is produced in a culture of cells (human diploid cells, vero cells, chicken embryos cells, etc.) and presented in its liophilizated form, accompanied with diluent. When reconstituted, it has to be maintained at a temperature between +2°C and +8°C, and discarded in, at most, 8 hours after its reconstitution. The minimum potency of the vaccines is 2.5UI/dose[9].

In Brazil, from 1997 to 2001, more than 400,000 people per year searched for care services, due to exposure or for considering themselves exposed to the rabies virus. Of these ones, 60% received some type of prescription of prophylactic treatment, and 13% quitted it[3]. According to data of studies, around 50% of the patients travelling overseas expect to return to their countries to start the PEP, exposing themselves to the risk of developing the disease; such situation configures incomplete or inadequate care services[10].

Study dated back to 1980 and 1990 shows that the highest rate of mortality from rabies in Brazil occurred in male children aged between 5 and 14 years old, accounting for 32.1% of the total. This study reports that 63% of the population affected belonged to the age group from 0 to 20 years old, and the most significant groups were among those younger than seven years old (24.8%), and 7-13 years old (23.9%)[11].

Much as rabies is uncommon in humans, as reported[6,7], the largest number of cases occurs in children younger than 15 years old, and 10% to 15% of the people attacked develop the disease. If it evolves and this human being has not received immunobiologicals (vaccine and/or heterologous or homologous serum), when symptoms appear, it might lead to death. Therefore, to learn and discuss strategies for this specific group is of fundamental importance, since innumerous researches have observed higher incidence in subjects younger than 15 years old[8,10,12,13], justifying, thus, the age group from zero to 15 years old chosen for this study.

Given the exposed, the present study aimed to analyze the epidemiological profile of rabies accidents in children and adolescents aged between zero and 15 years old who were attacked by animals that were possible transmitters of the rabies virus.

MATERIALS AND METHODS

This is a cross-sectional, descriptive and quantitative study conducted in the city of Maringá, which is located in the northeast region of the state of Paraná and has a population of 357,007 inhabitants, according to the 2010 census[14].

The population was composed of all children and adolescents aged from zero to 15 years old – totaling 101 rabies care services – who were attacked and registered in the anti-rabies care service records and in the Brazilian Notification Aggravation Information System (Sinan), in the city of Maringá, between January 1, 2010, and December 31, 2010.

The records were sent by BHUs and public hospitals to the Sector of Immunobiologicals of Maringa's Secretary of Health. The variables of study were: age (the age group indicated by the World Health Organization (WHO)[15] was used for analysis, with children aged between zero and < ten years old and early adolescents); race/color; occupation; gender; date of the care service; address; the victim's occupation; type of exposure to the virus; area attacked; condition of the aggressor animal; treatment prescribed; interruption or abandonment of the treatment. To verify whether the service was correct, the protocol norms of service of the Ministry of Health[16] were observed, which classify the correct prescription, analyzing the nature, the area exposed, the observation of the aggressor animal and its conditions.

Data was typed in the software Excel and then exported to be analyzed in the software Statistica 8.0. Simple and absolute frequencies were calculated for categorical variables, and, to verify associations of interest, univariate analyzes were conducted through Pearson's chi-square test, with confidence interval of 95% and level of significance set at <0.05 in all analyzes.

The study is part of the research project "Anti-rabies Prophylactic Treatment: Assessment of the Adequacy and Compliance of the Patient with the Treatment, in the city of Maringá, PR, in 2010", approved by the Standing Ethics Committee on Research Involving Humans (Cope) of the State University of Maringá (Legal opinion No 346/2010), and authorized by the Secretary of Health of the city (Cecaps – Center for Qualification in Researches and Social Projects), thus fulfilling the Resolution No 196/96 of the National Health Council. Informed consent forms were not used, since data were all secondary.

RESULTS AND DISCUSSIONS

Of all 311 services performed in 2010, in Maringá, PR, 101 anti-rabies care service records of children and adolescents aged 0-15 years old were selected, observing the predominance of males – 62 (62.0%) – in relation to females – 38 (38.0%); regarding education, 38 (55.2%) children were in Elementary School. For the age group from zero to < ten years old, 57.9% were white and 69.1% lived in the urban area, and, for the age group ≥ ten to < 15 years old, 21.0% and 27.7%, respectively (Table 1).

Table 1- Univariate Analysis of demographic variables, by age group, Maringá, PR, 2010.

	AGE GROUP				
	0 to < 10 years old		**≥ 10 to < 15 years old**		
	n	%	n	%	p
Gender (100)					
Male	13	13.0	25	25.0	0.6510
Female	24	24.0	38	38.0	
Education (69)					
Illiterate	13	18.8	05	7.2	**0.0004**
Elementary School	10	14.5	38	55.2	
High School	01	1.4	02	2.9	
Color (95)					
White	55	57.9	20	21.0	0.3187
Black	03	3.2	01	1.0	
Yellow	-	-	01	1.0	
Mixed	09	9.5	06	6.4	
Area (94)					
Urban	65	69.1	26	27.7	0.2763
Rural	03	3.2	-	-	

The prevalence of the age group repeats for subjects in Elementary School, highlighting that the age was statistically significant in relation to education for the occurrence of the attack. The analysis of color and residence area should be conducted with caution, since, for the city of Maringá, the vast majority of the population is white and lives in the urban area (Table 1). A study shows that, among children and adolescents aged from zero to 15 years old, 254 (61.6%) were male and 158 (38.3%), were female, thus observing the prevalence of males in the occurrence of the attacks[6].

As for treatment, out of the 101 prescriptions, 37 (36.6%) were made to the age group from zero to < ten years old, whilst 64 (63.4%), among those aged ≥ ten to < 15 years old. The variable with the highest prevalence was observation + vaccine, with 53 (52.4%) cases (Table 2). The treatment prescribed presented statistically significant association with age (p=0.0288).

Table 2 - Absolute distribution and percentage of people, by type of treatment prescribed and age group, Maringá, PR, 2010.

	AGE GROUP				
	0 to <10 years old		≥10 to < 15 years old		
	n	%	n	%	p
Treatment Prescribed (101)					
Observation of the animal	17	16.8	14	13.8	**0.0288**
Observation + vaccine	15	14.8	38	37.6	
Vaccine	05	5.0	07	7.0	
Serum+ vaccine	-	-	05	5.0	
Total	37	36.6	64	63.4	

Of all treatment prescriptions, most of them were made to the age group ≥ ten to < 15 years old, and the variable observation + vaccine presented the prevalence among others (Table 2). Just as occurred with males, the treatment prescribed obtained the highest prevalence in the age group ≥ ten to < 15 years old, since this is the most exposed age group to the risk and that with more contact with animals[6]. It is important to monitor the treatment prescribed for both children and adolescents, because the literature shows that the disease may develop among 10% to 15% of the people who are attacked by an infected animal[6].

Studies show that 354 children have received anti-rabies vaccine and/or serum therapy, which involved the high financial cost of these products. The psychological sequels that may be left due to the aggressiveness to which the infantile victim was exposed may lead to specialized treatment and support for long periods, resulting in economic and social cost, often incalculable[7].

The most prevalent species was the canine, with 95 (96.2%) cases, and, of these, 37 children (37.3%) belonged to the age group from zero to < ten years old, and 58 (58.9%), from ten to < 15 years old. About their conditions, the animals were healthy in 87 (89.6%) cases, and 53 of these cases (54.6%) happened in the age group between ≥ ten and < 15 years old; they were suspicious and dead/missing in four (4.1%) and three (3.0%) cases, respectively. About the animal needing observation or not, 83 (83.8%) cases were affirmative, prevailing the age group ≥ ten to < 15 years old (53.5%), and the cases that did not need observation (16%) also belonged to this very same age group, but with 9% (Figure 1).

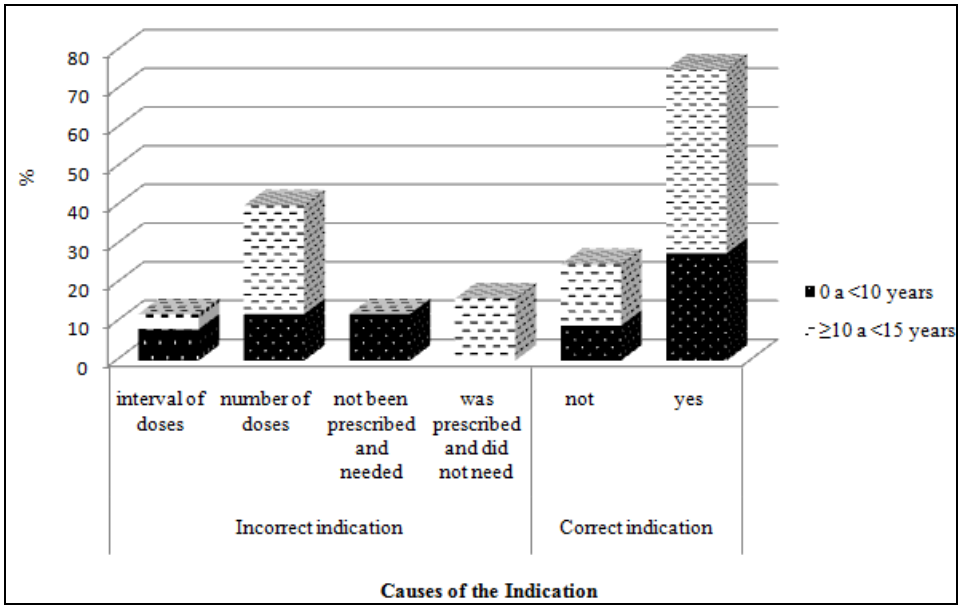

Figure 1- Distribution of anti-rabies accidents, by age of the victim and characterization of the animal, Maringá, PR, 2010.

The canine species prevailed mainly in the age group from ten to < 15 years old. In addition, comprehending this age, there are the felines and primates. It is noticeable that once more the prevalence occurs among those subjects aged from ten to < 15 years old (Figure1). Dogs are the most prevalent species, as observed in a study conducted with children and adolescents aged between zero and 15 years old, with 360 dogs (87.4%)[7].

About the health condition of the animals, this study verified that 288 were vaccinated (63.5%) and 165 (36.4%) were not vaccinated or had unknown vaccinal status. In the moment of the accident, 393 animals (86.7%) were healthy, 14 (3.1%) showed to be sick, while in other 46 cases (10.1%) this information was not registered because the animal was missing or had been killed right after the accident[8].

Regarding the type of exposure to the virus, bite was the most frequent, followed by scratch, which appear in 84 (75.0%) and 24 (21.4%) cases, respectively, and both prevailed in the age group ≥ ten to < 15 years old, with 55 (49.1%) and 16 (14.3%) cases. A total of 40 cases were observed on lower limbs, 23 (20.6%) comprehending the age group from zero to < 10 years old and, 28 cases (25.0%) on hands/feet, among which 19 (17.0%) happened to subjects aged from ten to < 15 years old. Single wounds (66.3%) and the type of wound, superficial (63.8%), presented relevance within the age group from zero to < 10 years old, the first one with 44.5% and the second one with 42.8% of the cases (Figure 2).

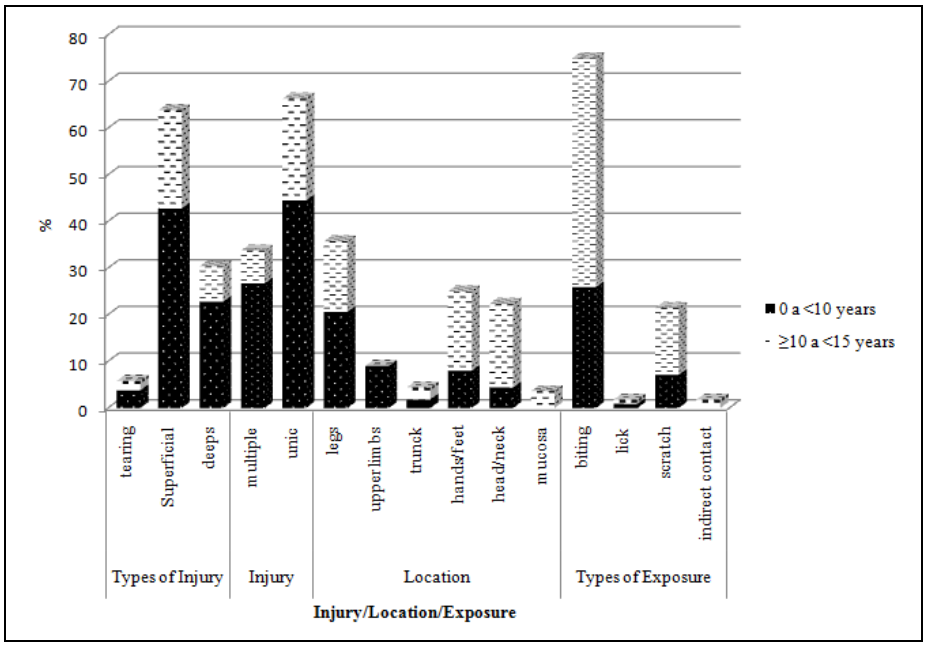

Figure 2 - Distribution of anti-rabies accidents, by age of the victim and the type of exposure/area of the wound, Maringá-PR, 2010. *Some cases presented more than one type of wound/area.

The wounds were mainly located on the lower limbs of subjects aged from zero to ten years old, and on the hands/feet of those aged from ten to < 15 years old, suggesting that, in the moment of the attack, the child or adolescent could be interacting with the animal and, according to the child-animal stimulus, the animal-child attack happened. Of course, the possibility of escape/defense of the child/adolescent during the attack is not excluded, taking into account that the height of the latter may have enabled more frequent attacks on upper or lower limbs (Figure 2).

Another study reports that, among 412 accidents with patients from zero to 15 years old, 362 (87.8%) were by bites and 50 (12.1%) by other types of aggressions, like scratches and licks, mainly. As for the most affected areas,

lower limbs (27.9%) and upper limbs (24.6%) stood out, and some children suffered bites on more than one area of their bodies. The study also reveals that these areas were more frequently attacked for the height of the victim and the escape and defense attempt[7]. Moreover, it was shown that the profile of the bite was similar in children (<12 years old), with predominance of single wounds (59.7%) and superficial wounds (52.2%) on the lower limbs (33.3%)[14].

Correct prescription of treatment was made in 25 (24.8%) cases, being predominant in adolescents over ten and younger than 15 years old, with 16 (15.8%) cases (Figure 3).

About the causes of incorrect prescription of treatment, the item "prescribed the wrong number of vaccine doses" had ten cases (40.0%), followed by "other", with five cases (20.0%). The causes of incorrect prescription presented statistically significant association with age (p=0.0493) (Figure 3).

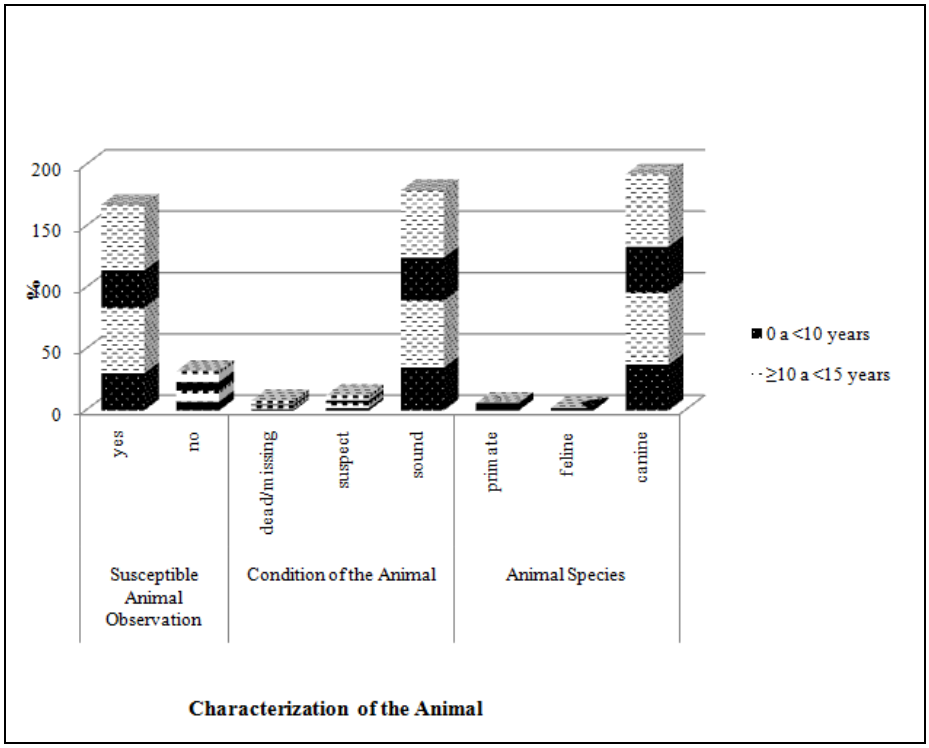

Figure 3 - Distribution of the anti-rabies accidents, by age of the victim, the correct prescription and the causes of incorrect prescription of treatment, Maringá, PR, 2010.

Correct prescription of treatment was predominant among those aged from ten to < 15 years old (Figure 3), showing, once more, that this age group presents higher risk for contact with animals. Besides, wrong treatment, for both ages, involves, in addition to financial cost, psychological sequels in relation to the aggression the victim suffered[7-11].

Finally, the analysis of the causes of correct prescription of treatment verified the highest percentage in the cause "prescribed the wrong number of vaccine doses", followed by "other". These facts suggest a mistaken analysis in the moment of the evaluation of the case, leading to the wrong treatment, and may put at risk the health of the patient that suffered the aggression, especially for the age group studied. The causes of incorrect prescription presented statistically significant association with age (p=0.0493) (Figure 3).

CONCLUSION

The present study allowed concluding that there was higher prevalence of incorrect prescription of treatment for those subjects aged

from ten and to < 15 years old, the early adolescents[8]. The population in the age group from zero to 15 years old is more exposed to this type of aggression because, besides the closer contact with the animal, they use more often the backyard of their houses, streets and public places, like leisure areas.

Thus, for the importance of the prevention and control of human rabies, nurses have to perform an educative role, clarifying and raising the awareness of the population about the risks of the disease, how to proceed after rabies accident, and the importance of vaccinating domestic animals[13].

Thereby, it is of great importance that such data are evaluated by managers, with a focus on the planning of efficient strategies towards the instruction and update of professionals who are close to and care for these patients, especially when it comes to children and adolescents, since it was verified that the latter have more contact with animals, regardless of domesticity. Moreover, these very same professionals are those in contact with the families of these children and adolescents, performing an educative job, raising the awareness on risks and gravity, stressing measures like registration and vaccination of animals, and treatment of diseases that can be transmitted from dogs to men, in addition to the update and attention when the therapeutic conduct is being prescribed, in order not to cause damages to the user, with wrong dosages of medications and vaccines, and eventual irreversible damages to the health of the population.

PERFIL DO TRATAMENTO PROFILÁTICO ANTIRRÁBICO HUMANO NO SUL DO BRASIL

RESUMO

O estudo objetivou analisar o perfil do tratamento profilático antirrábico de crianças e adolescentes de zero a 15 anos, no município de Maringá-PR. Os dados foram coletados do Sistema de Informação de Agravos de Notificação (Sinan) no período de janeiro a dezembro de 2010, sendo relativos no mês de dezembro. Realizaram-se frequências simples e absolutas para as variáveis categóricas, e, para associações de interesse, análises univariadas por meio do teste do qui-quadrado de Pearson, com intervalo de confiança de 95% e nível de significância <0,05 em todas as análises. Do total de 311 atendimentos realizados, 101 deles eram fichas de atendimento antirrábico de crianças e adolescentes. Em relação ao tratamento indicado, das 101 indicações, 37 (36,6%) apresentaram-se entre zero a < dez anos e 64 (63,4%) entre os ≥ dez a <15 anos. O tratamento indicado apresentou associação estatisticamente significativa com a idade (p= 0,0288). É preciso um trabalho educativo com crianças, pais e a população em geral, conscientizando-os sobre os riscos e a gravidade da raiva, além da atualização e atenção para a indicação da conduta terapêutica aos profissionais da saúde.

Palavras-chave: Vacinas antirrábicas. Vírus da raiva. Avaliação em saúde.

PERFIL DEL TRATAMIENTO PROFILÁCTICO ANTIRRÁBICO HUMANO EN EL SUR DE BRASIL

RESUMEN

El objetivo del estudio fue analizar el perfil del tratamiento profiláctico antirrábico de los niños y adolescentes de cero a 15 años en la ciudad de Maringá, Paraná. Los datos fueron recogidos del Sistema de Información de Agravios de Notificación (SINAN) en el periodo de enero a diciembre de 2010. Se realizaron frecuencias simples y absolutas para las variables categóricas, y para las asociaciones de interés, análisis univariado por medio de la prueba Chi-cuadrado de Pearson, con intervalo de confianza de 95% y nivel de significancia <0,05 en todos los análisis. Del total de 311 atenciones realizadas, 101 de ellas eran fichas de atención antirrábica de niños y adolescentes. En relación al tratamiento indicado, de las 101 indicaciones, 37 (36,6%) se presentaron entre cero a <diez años y 64 (63,4%) entre los ≥ diez a <15 años. El tratamiento indicado presentó asociación estadísticamente significativa con la edad (p= 0,0288). Es necesario un trabajo educativo con los niños, padres y con la población en general, concienciándolos sobre los riesgos y la gravedad de la rabia, además de la actualización y cuidado para la indicación de la conducta terapéutica a los profesionales de la salud.

Palabras clave: Vacunas Antirrábicas. Virus de la Rabia. Evaluación en salud.

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Submitted: 09/04/2012
Accepted: 13/06/2014