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Determinants of Rabies Prophylaxis Involvement based on Children's Experiences and Perspectives in An Endemic Area of Indonesia

Yosi Marin Marpaung[1], Rachel Monique[2]

[1]Lecturer and Researcher, Faculty of Medicine and Health Sciences, Krida Wacana Christian University, West Jakarta, Indonesia, [2]Research Scholar, Kasih Suwitno Foundation, South Jakarta, Indonesia

Abstract

Rabies studies involving children are still rare despite their vulnerability. As the critical preventive measure, understanding factors associated with their involvement in rabies post-exposure prophylaxis (PEP) is needed. A storytelling interview was conducted for 23 dog-bite and non-bite child-victims, aged 7-15 years, in an endemic area in Indonesia. Content analysis was carried with the help of Atlas ti.7. Unreported wounds and PEP delays were occurred. Children's capabilities, motivations, and opportunities can be critical to prevent it. Knowing the source of rabies, its visible features and consequences, and the first aid technique are needed. Children's willingness to report and follow PEP seem to be regulated by their attitude towards vaccine, familiarity of dog ownership, perceptions of wound type, and emotions around rabies consequences, parental punishment, and injection. Mother, peers, neighbours and dog owners need to be empowered in PEP measure. In conclusion, rabies PEP program should attentive to factors influencing children's behaviour to support PEP uptake.

Keywords: *post-exposure prophylaxis, rabies, children, qualitative*

Introduction

Rabies is a re-emerging disease in Asia[(1)]. In South and Southeast Asia, 14 out of 17 countries are categorized as being rabies endemic[(2)]. Annually, rabies claims up to 39.000 lives in Asia[(3)], of which children are the majority[(4)]

Children's vulnerability to rabies is not without reasons. Children were found unable to recognize abnormal dog behaviour, lacking knowledge to avoid an attack, and more likely to be injured for curiosity to play with dogs[(4–6)]. Moreover, dog-bite wounds commonly take place on the upper extremity of their bodies such as the face, neck, and head, hence escalating the chance to develop rabies instantly[(7,8)]. Children who live in a community where dogs tend to be part of life, usually in endemic location, will also be more susceptible[(9)]

Corresponding author:
Yosi Marin Marpaung
E-mail: yosi.marin@ukrida.ac.id

With such vulnerability, implementation of post-exposure prophylaxis (PEP) for children is the key, especially because PEP is the last preventive measure for rabies[(10)]. Although, PEP is a series of procedure which should be immediately taken after dog exposure and completely follow WHO recommendation[(11)], its implementations were often difficult according to studies[(5–7,10,12,13)]. These studies, however, were majority derived from adults, which is often proven to be inadequate to contribute in children-impacting program[(14)], looking at numbers of children affected. Provide children's perspective towards rabies PEP practice.

Methods

The study was conducted in East Nusa Tenggara, Indonesia because of its status as a rabies endemic and a need to well actualize PEP[(15)]. Participant recruitment was done by purposive sampling. The inclusion criteria were children aged between 7 to 15 years who had at least an experience of a dog exposure (bite or non-bite) in the past. Recruitment was done by searching on the dog-bite

victims register and door-to-door. Data saturation was reached after 23 participants.

Before data collection, consent was requested to one of parents/guardians and assent was sought for the children. Both were carefully explained about the research. First explanation was made to the parents/guardians, and then to the children in front of their parents/guardians. Chances to ask questions, to decide participation and setting convenient for data collection were given.

Storytelling-interview was used. It is a friendly way to collect data from children, as it allows them to express and decrease power-inequality to the adults[16,17]. During data collection, for convenience, parents/guardian and a government officer were present and observe from a distance. Children were asked to write a story themed *"a child who gets bitten by a dog"*. No limitation set to the story length, the writing time, and the places to write. After finished writing, storytelling in front of the researcher began. Positive feedback was given and continued with an interview. Open-ended questions, 'do not know' and silence were allowed to prevent biases in children[18]. A maximum of 30 minutes were decided for children rapport. Without notified previously, new stationaries as an appreciation were given. All storytelling interviews were audiotaped and written works were stored.

Content analysis approach were used with Atlas.ti 7 and COM-B from Michie et al[19] as a guide. The study was approved by the Wageningen University Social Sciences Ethical Committee. Prior to commence, this research also received approval from the local Public Safety and Politics Department, the local Department of Husbandry and Agriculture, and Department of Health.

Results

Below are the explored factors associated with post-exposure rabies prophylaxis involvement based on children's experience and perspectives.

Knowing rabies source and its visible features

Canine and human rabies terms were familiar to all children. Canine rabies were associated mostly with strange physical appearances, referred to its sharp teeth, tucked tail, cocked ear or tail, big posture, and excessive saliva; and with abnormal behaviours, such as tendency to attack unreasonably. A couple mentioned unvaccinated dogs as rabid. Almost all children wrote that dog-bite can transmit rabies to human, yet could not describe human rabies features. Rabies was only said to cause a hard time surviving in human. A few, however, addressed a feature of mimicking dog's behaviours, such as the tendency bite, scratch, scream, and fear of light. These consequences were feared by the children. Most of them expressed the need to be treated.

Familiarity to dog ownership status

Most children addressed that any type of dogs whether familiar (domestic) or not (stray) can transmit rabies. A small number of children, however, considered that only stray dog is risky. Domestic dogs either owned by them or acquaintance were perceived safe from rabies.

Is this wound safe or unsafe?

All types of wound were addressed risky by many. However, a small group of children who experienced scratch addressed its insignificance to cause rabies due to its small size which can easily be treated at home and its low degree of pain, hence, does not need to be vaccinated or even reported. Only a deep wound, irrespective of size, or a torn with blood presence were considered risky. A worsened wound was also signed as rabies-poisoned.

Knowing wound cleaning as a must

Wound cleaning was repeatedly mentioned as a must action to do after attacked. Yet, nearly all did not know 'why' it is performed. Only one child addressed that it is to prevent rabies. For the procedure, soaping and rinsing the wound with water occurred a lot. Some added extreme techniques such as brushing, wiping, or scrubbing the wound with a tool, hand, or cloth. The disappearance of teared skin was regarded as a 'clue' to end wound cleaning.

Vaccine as a 'drug', timing, and injection experience

Children added 'injection' (vaccination) as a part of wound treatment and protector against rabies. Vaccination was viewed as having drug function which can kill the virus, heal the wound, or heal someone from rabies. For the timing, most mentioned vaccination must not be delayed. Others mentioned the ability to delay if incident happens in the evening or out of vaccination centre operational hours. Some children described

negative experiences with injection, either prior to or after having first vaccination series. This made some of them avoid immediate vaccination or completing its series.

Mother as helper, model, and treatment organizer

Among other members, mothers were very often cited as the first party to whom children will seek help. Children often felt less confident with their wound cleaning skill and refer to mother's help which gave them the feeling of cleanliness. Mother was also act as a model for children's first aid skill. A child felt confident to do the wound cleaning after four times observing his mother. In addition, mother was depicted as the organizer for the vaccination. Children mentioned an active role of mothers in arranging schedules to complete the vaccination series.

Fear of parental punishment

The likelihood of parental punishment, both verbally and physically, seems high if children are found injured by a dog. Children's response to this fear appears in two distinct reactions. Some were hiding because they did not want to be beaten or scolded. Other children did the opposite for fear of being punished

Peers as reference and reporter

Children seem to take peers as their reference for rabies and PEP knowledge. Some children addressed that their peers triggered fear which made them uneasy to accept the treatment. Peers also said to have the role as an incident reporter, especially when the incident happens when children are playing together.

Neighbours' fast response support

Neighbours were written to provide fast response support upon the injury by locating and bringing the helpless child home. When parents are not around, children would also seek help from the neighbours. Having a health worker as a neighbour was mentioned to also be beneficial as he/she can provide a fast response wound treatment and vaccination.

Receiving responsible gesture from dog owners

Children addressed that the owner whose dog injured them had made the treatment possible. Children described how the dog owner connected them to the paid private vaccination service when the free vaccination centre operated by the government was closed. Dog owner also bore the transportation cost.

Discussion

Knowledge regarding visible rabid features in animal can promote children's involvement in PEP. The need of accurate knowledge to correctly identify rabid features in animal are also reported in other studies[5,6]. There is a tendency, however, that in endemic area, children overrated the features. For example, sharp teeth and big posture were also said to be part of it. This may need to be corrected to avoid unnecessary fear among children, while still keeping their attitude alert toward dogs. Not only in animal, but also the depiction of rabies impact in humans seems accelerating PEP involvement. Children awareness related to the human rabies features, however, is still more to the furious type of rabies. None delivered the paralytic symptoms which are known to be more subtle[11].

Children in endemic area also tend to see the wound caused by all types of dogs, familiar or not, as risky therefore will react in a faster report. Some however still based the risk on familiarity toward dogs. This can be dangerous as familiarity has contributed to a slower response to PEP[13,20].

Children who consider minor wounds as unimportant can leave their parents unnoticed. Similar reason has made delayed reports and PEP in other studies[6,10,13,21]. Beside minor wounds, this study also adds that some children may perceive risk only if the wound has been worsened. Helping children to notice risks in wounds should be done to prevent PEP delays.

Knowledge and skills of wound cleaning appears to be low among children, although it is essential[12]. Many children could not describe the procedure according to recommendation[14]. Instead of using duration, children used the disappearance of wounded skin to determine when the washing can be ended. Inappropriate tools and techniques was also mentioned, which in practice can worsen the wound condition [27]

Despite its emergency, vaccination had been delayed in some children for reasons beyond the reach of them. This may need to be investigated further. Meanwhile, positive injection experience is also imperative to be looked, as it can increase willingness to comply the entire series[22]. This signals the need of pain-management skills among local health personnel.

Parents, especially mothers, are the key for children involvement in PEP as they cited repeatedly. It is well known that in developing countries, mother is the most important player to regulate children's involvement in treatments[23,24] and influencing other family members to child's treatment[25,26]. Mothers should be empowered for their optimal role in children's PEP journey. Parents whom children are mostly relied upon, at the same time can be feared for their punishment. Parental punishment can drive a faster response[27] to report, yet should not be made as the norm in dog-bite cases. Instead of reporting, the response given by some children can be undesirable such as hiding the incident from the adults.

Children's peers need to be empowered as they tend to be the reference to other children for rabies and PEP knowledge and can act as the reporter when incident occurs at the playfield setting. Friendship, support, care, and mutual giving and taking which are valued during childhood period[38], can be brought along in the process of knowledge building and children empowerment on rabies and PEP.

Finally, neighbours and dog owners have a crucial role to support faster response to PEP as they were also being sought when children need help and had helped the treatment possible. The role of neighbours should be made known in the community to improve social responsibility to protect the children altogether.

Conclusions

Various factors could determine children's PEP uptake success in an endemic area. For children this includes having knowledge to distinguish features of abnormalities in rabid animal, being aware of the rabies consequences in human, understanding the rabies PEP benefits, timing, and correct wound cleaning method, having correct attitudes and beliefs toward risks around dog ownership status and types of wound. Mothers need to be a competent teacher and organizer throughout the PEP schedule and should note that punishment norm can backfire, producing undesired response towards incident. Children peers should be empowered as a responsible resource and incident reporter. Finally, the role of neighbours and dog owners should be made known as an important part of prevention measure in the community.

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Declarations

Ethics approval: This study was approved by the Wageningen University Social Sciences Ethical Committee. Consent was obtained from all parents or guardians and assent from all the children participants.

Competing interest: The authors declare no conflict of interest.

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