

# Pregnant with puppies

## The fear of rabies in the slums of New Delhi, India

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### Abstract

In New Delhi, some migrants from central-eastern India espouse a belief in ‘puppy pregnancy’, or the notion that after being bitten by a dog its puppies are conceived within the abdomen and their growth leads to an awful death. This article suggests that this belief is related to the widespread fear of rabies. This lethal infectious disease causes one-half of deaths in India, leaving behind grief-stricken families and shocked communities. This rabies-related shock results not only from the disease per se but also from the long, painful, and disturbing post-bite vaccination prophylaxis, using a nervous tissue vaccine, in which bite victims receive fourteen distressing injections in the abdomen in the hope of saving them from death. I propose here that dread of this vaccination may have stimulated, within an already fertile cultural milieu, the belief in this unnatural, animal pregnancy.

### Keywords

rabies, dogs, India, fear

### Introduction

The topic of this article is the belief in puppy pregnancy. People suffering from this anomalous animal pregnancy think that when a person is bitten by a rabid dog, its puppies are conceived within their abdomen. It is believed that victims, particularly men, die if they do not expel the puppies soon after a bite. This article is mainly based on the ethnographic

material I collected in 2012–2013 and 2015 in five slums of New Delhi (Nizamuddin, Shadipur, Tis Hazari, Sarai Kale Khan, and Okhla), where the majority of the inhabitants are migrants who have moved to the capital from the most destitute areas of India, mainly Uttar Pradesh, Jharkhand, Bihar, Assam, Rajasthan, and West Bengal. I became aware of this belief in puppy pregnancy in Tis Hazari Slum while talking with Jhoti,<sup>1</sup> a timid ten-year-old girl, about the physical and behavioral alterations that manifest themselves, as she said, ‘when a mad dog bites a person’. I have to admit that initially I was quite puzzled by her words, and I wondered whether this idea was just a figment of her imagination or the result of her misunderstanding a previous explanation of rabies given to her. Then, two other children of the same slum, as well as their mothers whom I interviewed privately, told me with no hesitation a very similar story. Again in response to my questions about the symptoms of rabies, some days later the issue re-emerged in Shadipur Slum. Hence, I decided to include this topic in my structured interviews. In the five slums I worked in, both children and adults of both sexes were aware of this disorder and could speak about it with a fair level of detail

<sup>1</sup> All the informants’ names have been changed, but still reflect their religious affiliation. Other personal information that could identify informants (such as employment, family size, place of origin, etc.) has been omitted. Interviews were carried out at different times between April 2012 and May 2013, and in January and February 2015. About 110 children and adults were interviewed, and only a small number of them knew of and talked about the puppy pregnancy disorder; I make no claim of statistical accuracy about the prevalence of this belief. Questions were pre-tested and refined before their actual administration. Although I am familiar with Hindi (the language mainly spoken in New Delhi and in northern India), for the interviews I always sought the assistance of two translators because informants, being migrants from all over India, could have been uncomfortable with my standard Hindi. The translators were fluent in English, Hindi, and their native language (Punjabi and Sadri). One was from Jharkhand (a state located in Eastern India where this belief is particularly strong), and thus familiar with the languages spoken there (Munda and Oraon). The residents of Nizamuddin were acquainted with the other assistant, because he had already worked there as a translator for foreign researchers. I told the people we visited that the purpose of my questions was a book on the relationship between people and dogs in India. Verbal consent was sought before starting the interviews and recording them. The interviews with children were arranged in order not to interfere with their lessons or their duties at home (particularly in the case of girls). During the first interviews with the children, some adults occasionally attended. Soon a relationship of trust was built, but we continued to carry out the interviews in public, sitting on a *charpaj* or blanket in the yard. The interviews were semi-structured; the translators knew the questions by heart, but were instructed to open up the discussion whenever relevant and useful. As the conversations were usually in Hindi, I was also an active part of them. I asked for immediate translation whenever another language was used or I could not follow the informant. Interviewees were not remunerated. Whenever required we provided advice on appropriate post-exposure prophylaxis in reliable health centers in case of dog bite. All the children we met, even those who refused to talk with us, were gifted a small animal toy.

(although not without several internal discrepancies). On several occasions, during my conversations with adults, I asked whether they had ever met anybody who did not consider their conviction to be credible and thus questioned it. With the greatest seriousness they all answered negatively, stating clearly that within the community of their slum in New Delhi, as well as in their home village, everybody *knows* what happens to victims of rabid dogs.

The aim of this article is not only to provide a description of the belief in puppy pregnancy from an anthropological perspective, but also to offer some preliminary remarks that might help explain it. The hypothesis I propose here is that the dread of the antirabies vaccination therapy, which for decades consisted of fourteen painful injections in the abdomen, may have stimulated this belief in puppy pregnancy, or contributed to stimulate it within an already fertile cultural milieu. Vaccinations, and fear and skepticism towards them, are a quite common topic within sociology, anthropology, the history of medicine, and public health. In particular, studies about preventive vaccinations and large vaccination campaigns are numerous (Darmon 1984; Keck 2013; Moulin 1996; Streefland 2001). What marks this article as distinct is that its focus is solely on post-exposure vaccination, after the animal bite has occurred. As far as rabies is concerned, pre-exposure vaccination is expensive, is not life-long in its efficacy, and does not exempt people from receiving some boosters after being bitten. Hence, pre-exposure vaccination is meant only for people who are at a high risk of exposure, such as veterinarians, animal handlers, and rabies laboratory workers. The vast majority of rabies victims, in India as well as globally, does not belong to these categories and so is not subject to pre-exposure vaccination.

An alternative to the hypothesis I propose here is that presented in an important and thought-provoking article by the psychiatrist Chowdhury and his colleagues (2003), which concludes that this phenomenon can be described as a culture-bound syndrome. To my knowledge, this is the only scientific paper that has been published on the topic of puppy pregnancy to date. It is based on the cases of seven patients suffering from this condition in a rural area not far from Calcutta, in eastern India. Although I recognize that some local cultural elements may have contributed to shape and strengthen this belief, I suggest that something more may lie at the basis of this belief: the fear of anti-rabies vaccination. I argue that the culturalist view advanced by Chowdhury and his colleagues is partial and does not take into consideration the historically situated entanglement, in recent times, between patients, doctors, and vaccination prophylaxis.

Another entanglement, of a multispecies nature, is there at the basis of this article: the one among dogs, the rabies virus, and humans. In their famous introduction to the special issue of *Cultural Anthropology* on multispecies ethnography, Kirksey and Helmreich (2010, 545) invite anthropologists to reconsider the position of animals and micro-organisms in their work, not relegating them to the realm of *zoe* but looking at them alongside humans in the

realm of *bios*. This means, firstly, acknowledging the previously denied biographical and political lives of other-than-human species and ‘quasi-species’ (Lowe 2010, 625) such as viruses. Secondly, it also means admitting that if animals and micro-organisms, thought of as ‘bare life’ (Kirksey and Helmreich 2010, 545; see also Agamben 1998), can easily be controlled and eventually killed – if they are not already seen as ‘dead physical features of the [human] landscape’ (Anderson 1951, 1) – as actants (Latour 1987) in a web of relations, they can also be the ones who kill. Zoonoses, infectious diseases of animals that can naturally be transmitted to humans, and ‘zoonotic ecosyndemics’ (Singer 2014) have hence recently become an important theme of investigation for medical and environmental anthropology and a well-suited field on which to apply multispecies ethnography.

In their study of other-than-human organisms whose lives and deaths are connected to human social worlds, multispecies ethnographers remember well Haraway’s (2008, 244) teaching that ‘becoming is always becoming with – in a contact zone where the outcome, where who is in the world, is at stake’. Becoming-with, as Wright (2014, 278) writes, challenges delusions of separation and interspecies invulnerability. The results of this highly transformative process are ‘becomings’, what Kirksey and Helmreich (2010, 546) describe as ‘new kinds of relations emerging from nonhierarchical alliances, symbiotic attachments, and the mingling of creative agents’. In other words, they are neither imitation nor literal body transformation, but manifest themselves in the relational dimension. As Nading (2013, 60) observes, ‘scholarship on human-animal “entanglement” focuses on the ways in which disease, instead of alienating humans from other life forms, brings their intimate relationships into sharper relief’. According to the people with whom I discussed puppy pregnancy, the victim of a rabid dog does not imitate dogs’ behavior nor transform into a dog. On a relational level, much more happens: through its teeth the dog makes the person pregnant and its puppies start growing inside their abdomen, in the same area of the body and in the same modalities human babies are meant to develop and eventually come into the world. As my informants narrate below, the expecting person feels these puppies inside and is mentally and physically connected to them; it is the course of this relationship with the puppies that will eventually decide the impregnated person’s survival or death.

Rabies has been and is still regarded in many parts of the world as one of the most terrifying diseases, and certainly as one of the pathologies causing the most terrible death. As Hampson and colleagues (2015, 14) have rightly observed, the anxiety associated with a life-threatening bite from a rabid animal should be given more attention, and precise quantification, from those scholars who calculate the economic burden of rabies. However, despite being a major topic, it remains very difficult to investigate, and only suppositions are available at the moment. For example, Hampson and colleagues (2015) claim that anxiety could be substantial, resulting in more than 10 percent of the total burden of this disease.

Although this article does not contribute a quantitative analysis to this pressing research question, it can however provide unique and useful qualitative data to improve our understanding of rabies-related fear and its consequences on the physical and mental health of the victims of a potentially rabid animal, their families, and their communities. This is of paramount importance not only for a deeper understanding of rabies and puppy pregnancy syndrome, but also, and especially, for a practical improvement of the quality of life of dog-bite victims.

## Rabies

Rabies is a viral zoonotic disease of humans and other mammals that attacks the central nervous system and causes acute encephalomyelitis. Infection occurs when the virus is introduced into the system from an open wound that comes into contact with the saliva of the infected animal (usually a dog, a cat, a bat, a skunk, a wolf, a fox, a jackal, etc.), typically through a bite, a scratch (if nails are soiled with saliva), or a lick on abraded skin or mucosa. The virus moves along nerve tissue to the brain; when it reaches it, the first clinical signs of the disease appear and no effective cure can save the patient's life. The incubation period in humans is highly variable (from a few weeks to more than one year), since it depends on the distance of the wound from the brain, the seriousness of the bite, and the quantity of saliva deposited on the wounded surface or inoculated into the bite. However, it generally lasts from one to two months.

The prodromal phase of rabies is marked by generic symptoms, such as weakness, fever, headache, loss of appetite, malaise, nausea, vomiting, myalgia, asthenia, anorexia, insomnia, and abnormal sensations radiating from the site of the wound. The second and last phase is marked by more specific symptoms that vary by type of rabies: encephalitic ("furious") or paralytic ("dumb"). In furious rabies, symptoms include uncontrolled excitement, agitation, confusion, hallucinations, combativeness, aberrations of thought, aggressiveness, meningism, tachycardia, hyperactivity, disorientation, hypersensitivity to stimuli, muscle spasms (when they affect the mouth, they cause excessive salivation), hyperesthesia, and paralysis of vocal chords (which causes voice alterations). Occasionally, priapism (abnormal painful erection, not accompanied by a normal sexual desire) and spontaneous ejaculation are possible. Hydrophobia (inability to swallow water due to painful spasmodic laryngopharyngeal

contractions) appears in about half of the cases.<sup>2</sup> In the rare case of dumb rabies, the course of the disease includes lethargy and growing paralysis of breathing and swallowing muscles.

After a few days from the onset of this second encephalitic phase, death invariably comes due to respiratory insufficiency. Even the most intensive supportive care is generally futile and there are no specific drugs or therapies to save patients' lives or relieve their suffering. Rabies has a case-fatality rate of 99.9 percent, the highest among zoonoses (Wunner 2010, 2). The diagnosis of rabies during life is a clinical one, depending upon the skill and knowledge of physicians and the ability of victims to correctly remember the unfortunate event of their biting (for example, whether the bite was provoked or unprovoked makes a substantial difference in terms of diagnosis). A precise diagnosis is possible only after death, through a microscopic examination of the brain.

Rabies annually kills more than fifty-nine thousand people globally, but almost one-half of the global burden, twenty-one thousand human lives, are reported in India alone (Hampson 2015, 10). This means that in India a person is bitten by a rabid animal every two seconds and dies of rabies every thirty minutes (Abdul Rahman 2011). Consequently, on 7 June 2012 the World Health Organization (WHO) declared India a 'high risk country'. Domestic dogs are the main vector, causing 96.2 percent of human cases (APCRI 2004, 17). Since rabies affects mainly poor and marginalized people, it is widely neglected in low- and middle-income countries. This happens in India as well, where neither human nor animal rabies is considered a priority by the Ministries of Health and Agriculture. Despite being endemic in India, rabies remains a non-notifiable disease in that country, which means that no official record has to be kept at a state or national level. As such it is very difficult to ascertain the extent of the occurrence of this disease in India.

Although epidemiological data on rabies is far from being exhaustive in India, the most affected states seem to be Uttar Pradesh, Odisha, Delhi, Bihar, West Bengal, and Maharashtra (APCRI 2004, 22). Two-thirds of India's population lives in villages in the rural areas, where 76 percent of rabies cases are reported (APCRI 2004, 16). The people who live in these areas are more vulnerable to rabies, because they are particularly exposed to potentially rabid animals and often do not receive adequate and prompt medical care. As a pan-Indian study has revealed, the majority of dog-bite victims do not receive any rabies

<sup>2</sup> Contrary to popular belief, rabid dogs are not hydrophobic. Quite the opposite: they drink normally and they also swim. Since symptoms of rabies in human beings are sufficiently different from those of other animals, 'hydrophobia' is used only to describe the disease in human beings.

vaccine (APCRI 2004, 28), demonstrating gross negligence on the part of both the victim as well as the health care system. The most common victims of rabies are men and boys (71 percent), those who live in rural or semiurban areas (76 percent), and those who belong to low-income families (87 percent). Among children under fourteen years of age rabies has a particularly high incidence (35 percent).

WHO recommendations on the treatment of dog bites divide rabies exposure into three categories: category I, when the victim has been touching or feeding infected animals, but shows no skin lesions; category II, when the victim has received minor scratches without bleeding or has been licked by an infected animal on broken skin; and category III, when the victim has received one or more bites, scratches, or licks on broken skin or has had other contact with infected mucus. A study carried out in New Delhi showed that most of the people (79 percent) who visit a health center following a dog bite fall into category III, the most severe (Chhabra et al. 2004, 218). Bites were to lower limbs, upper limbs, and chest and back (55 percent, 30 percent, and 2 percent, respectively). The farther the wound is from the brain, the longer the virus takes to reach the central nervous system and to show the symptoms of rabies. In fact, 32 percent of the surveyed cases had an incubation period of thirty-one to sixty days, followed by sixteen to thirty days (22 percent), and sixty-one to ninety days (18 percent). More cases (5 percent) had a long incubation period of six months to one year, compared to those (4 percent) that showed symptoms within fifteen days from exposure. In 3 percent of the cases the disease stayed latent for one, two, or even more years before breaking out.

In a study carried out in six Indian towns, Ichhpujani and colleagues (2006, 357–60) found that only 69 percent of the surveyed people had heard about rabies and their awareness of the disease was fragmentary and inadequate. From a study in 2015 in rural West Bengal, it emerged that the main sources of information regarding what to do in the event of an animal bite were neighbors (55 percent) and relatives (15 percent), particularly women (Chaudhuri 2015, 3).

Because the main carriers of rabies in India are dogs, the issue of dog population management needs to be briefly discussed. Dogs, humans, and the lyssavirus are thus entangled not only in relation to science but also to (bio)politics (Srinivasan 2012). Mass culling of the dog population has historically been used to control rabies in India, both during British colonization and after independence (Reece 2007). However, evidence shows that in the current social and ecological conditions of India this method is totally ineffective in controlling the disease and, more generally, the dog population (WHO 2004). A much more efficacious alternative is ‘animal birth control’, a program implemented in numerous

Indian cities since 2001 that involves capturing street dogs,<sup>3</sup> surgically sterilizing them, vaccinating them against rabies, and bringing them back to their location (AWBI 2009). So far this program, which also includes campaigns to spread awareness of rabies, has been implemented mainly in urban areas and not with the same intensity all over the country, for reasons that span from shortage of funding and logistical support to lack of political commitment. Hence, it has still to reach the underprivileged rural areas of eastern India where the belief in puppy pregnancy is found.

### And then puppies will grow in your abdomen

In the slums of New Delhi, where I investigated the perceptions and awareness of rabies, the most interesting and rich topic of debate was the consequences of dog bites and the first symptoms that reveal the presence of the pathology. Most of the people I met mentioned behavioral changes, while very few respondents spoke of physical alterations. However, among these a striking majority was of the opinion that dog puppies will grow in the abdomen of the person who has been bitten.

According to Arun, a thirteen-year-old boy from Assam, the puppies are the offspring of the dog responsible for the bite and they start to grow in the abdomen three days after the bite. Victims realize what is happening to them ‘because the abdomen starts to grow, as it happens to a pregnant woman. And you feel that your body is heavier than usual, because puppies weigh’. When asked whether he had ever seen this happening or had simply heard about it, Arun immediately said that he had seen it in his village in Assam, where three days after his friend’s dad had been bitten by a dog his abdomen started to grow. Unfortunately, Arun did not witness personally what happened later, since he moved to New Delhi, but according to Arun’s uncle the bitten man died soon after the incident.

Siwri, a seventeen-year-old girl from Bihar, shared Arun’s view except on the length of the period between the bite and the beginning of the pregnancy. In her opinion, at least three months are needed. However, unwanted pregnancy can be avoided easily if the bitten person takes promptly the medicines that are supposed to ‘kill the puppies before they start to grow’.

<sup>3</sup> The WHO uses a matrix based on dogs’ levels of restriction and dependence on humans to divide them into four categories: family owned, restricted dogs; family owned, partially restricted dogs; unsupervised neighborhood/community dogs; and feral dogs. The term ‘stray’, although common, is too vague as it defines any dog permitted by its owner to roam free on public property.



If this medical intervention is not sought, puppies start to grow. Sarita, a forty-five-year-old woman from the same state, described the first symptoms of this anomalous pregnancy. ‘You feel itchy, because they move. And you also feel a lot of pain, because they bite your stomach. Of course you become mad; how can you not become mad, with this going on in your abdomen?’ Sarita was also one of the first people I met who had a clear idea of the consequences of this pregnancy on the health of the bitten person and the puppies. First of all, to her it was evident that puppies cannot be delivered, because they die before reaching the expected end of the pregnancy. The reason for their death is that they are ‘poisonous’ and ‘toxic’. Moreover, this poisonousness and toxicity also cause the death of the person who has them in their abdomen.

Despite Sarita’s confidence, the details and consequences of puppy pregnancy were a matter of wide disagreement among the people I spoke with. Most people thought that puppies can, and should, be delivered but this is much easier in the case of women, since their anatomy and physiology is suited for birth. Jhoti, the ten-year-old girl from Uttar Pradesh, was absolutely sure that ‘in women they come out as babies do’, but in men ‘the puppies will die and so [will] the men who have them in their abdomen’.

Amina, a forty-year-old woman from Bihar, claimed to have seen puppies that had only been just delivered by a woman who had developed them in her abdomen after being bitten by a dog. She even brought me to see the exact point of the street where the delivery happened ‘a long time ago’ and where the woman eventually died. She stated she had not seen the exact moment of the delivery, but only the woman’s dead body on the road surrounded by her fourteen newborn puppies. People who witnessed their birth confirmed that she had delivered them as if they were babies, through a vaginal delivery.

According to Amina, everybody in the area knew and gossiped about her delivery. Saleeq, a thirty-two-year-old fellow-countryman of Amina, who has lived a few houses away from her since they both moved to New Delhi two decades ago, stated he could not remember this incident. However, he claimed he had known personally a woman who safely delivered her puppies, although she did not keep them with her. In this case the delivery was safe since it had happened in the hospital, ‘in Irwin hospital’<sup>4</sup> as Saleeq specified, and had been preceded

<sup>4</sup> Irwin Hospital, renamed Lok Nayak Jai Prakash Hospital in 1977, is one of the most prestigious public hospitals of New Delhi; in the fifties, it was one of the largest hospitals of all northern India, receiving patients not only from the capital but also from nearby states. The fame of this hospital likely reached Saleeq while he was still at home in Bihar, before moving to New Delhi. Irwin Hospital is not the closest hospital to Saleeq, since it is located between Old and New Delhi. However, it is only a few kilometers north of the slum.

by an X-ray through which the puppies were clearly seen by the medical staff. Eventually the puppies were taken out through ‘an operation’, or a caesarean birth.

Muhammad, a twenty-six-year-old man from Bihar, described how puppies can eventually come out of the mouth and the nose, in the case of men who become pregnant. His statements are based on what he claimed to have personally seen. However, since this happened ‘fifteen or sixteen years ago’ he also added, ‘I don’t remember very well, since I was a kid’. Muhammad says he saw puppies coming out of a man’s nostrils and the mouth, and he also vividly remembered them making the sound ‘au, au, au, au’. While repeating this sound he mimicked newborn puppies who cry for their mother, closing his eyes, frowning his face, and simulating a vulnerable and mournful expression. The puppies Muhammad claimed to have seen coming out of the man were as long and thick as his forefinger. In Muhammad’s opinion, men and boys are particularly at risk not only because they cannot naturally deliver the puppies but also because when the puppies grow too much and they cannot physically come out of the mouth and nostrils, the victim starts to experience excruciating and terrifying pain. He stated that ‘when they grow up they have nails in their paws and they start scratching inside, they start scratching the body from inside’, while with his nails he scratched the skin of his abdomen miming deep abrasions and unbearable pain. The consequence of these scratches is that ‘he will have all blood inside and his intestines will be destroyed’. Eventually ‘he will die. He will die with the puppies in the wound and in his body’.

Arjun, a thirty-five-year-old man from Jharkhand, provided another version of the consequences of this pregnancy in men and boys. In his opinion, when the puppies become too big to stay in the abdomen, it simply and inevitably bursts. Arjun told me that he personally saw a dead man with his open abdomen and two dead puppies in it. No other details of this incident were available, since he also justified himself by saying, ‘but I don’t remember this thing very well’.

Several other interviews of this kind provided useful information, sometimes consistent, sometimes conflicting, to add details to this unique conviction. On one point almost all the people I met and interviewed agreed: puppies develop from the poison (*jeher/vis*) or germs (*bī*) that reside in the dogs’ teeth and enter the body of the victim through the teeth’s penetration of the skin. The same confidence with which the children talked about puppy pregnancy was also in their words when asked about the poison, or the germs, that are their vehicle into the body of the victim: ‘the poison that is in the body of the dog goes into your body’ (Suraj, male, eight years old, from southern Nepal); ‘the poison of the dog spreads

inside your body and you become totally blue' (Pradeep, male, twelve years old, from Haryana);<sup>5</sup> and 'the liquid that comes out of the wound is green because it is the combination between your blood, which is red, and the poison of the dog, which is blue' (Ravi, male, nine years old, from Bihar).

After entering the body of the victim through this poisonous liquid, the still-minuscule puppies travel to the abdomen where they start to grow. If not delivered or taken out through a caesarean birth, they continue to move upwards inside the body and eventually reach the mouth and the nostrils. However, some puppies are also believed to remain in the wound, just below the skin, where they cause tremendous itching and start to poison the body of the victim.

## Dying of rabies or dying of fear?

Rabies is one of the most frightening diseases in any culture where it is known (Macpherson, Meslin, and Wandeler 2013). This is explained by its gruesome symptoms; the inevitability of death; the discomfort, risks, and uncertainties associated with treatment; and the unpredictable and sometimes very long incubation period before the disease declares itself. Moreover, rabies exposes not only the victim but also their family to a destabilizing shock.

After all, the etymology of the term 'rabies' is enough to evoke worrying feelings. This word derives from the Latin '*rabere*', which means 'to rave', and is also strictly linked to the Sanskrit '*rābhas*', which means 'to do violence'. Similarly, the *Suśruta Samhitā*, the first medical treatise in which rabies is mentioned, composed in the seventh century BCE by an Indian physician, refers to this disease with the word '*jalatrasā*', from '*jala*' ('water') and '*trasa*' ('fear') to underline the agony caused in patients by water (Bhishagratna 1991, 734). In northern India several local languages follow this Sanskrit word. In Hindi we find '*jalasantra*' (from '*jal*', 'water', and '*asantra*', 'fear'), '*jalabbī*' or '*jalabbītī*' (from '*jal*', 'water', and '*abbī*' or '*abbītī*', 'fear'), and '*jalantakā*' (from '*jal*', 'water', and '*antakā*', 'mortal' or 'destructive'). The Bengali version of '*jalantakā*' is '*jalatānka*', while the Assamese one is '*jalatonka*'. It is interesting to note that in the *Suśruta Samhitā* '*ātanka*' means 'disease', 'fever', 'pain', 'mental distress', 'anxiety', and 'fear', and it is also used to refer to the roll of drums. In western India, rabies is termed '*halqa*' or '*halga*' in Kashmiri, '*hadkwa*' or '*hadka*' in Gujarati, and '*birkiā*' or '*hidkiā*' in Marwari (in particular in the area of Jodhpur, in Rajasthan). In Hindi we also occasionally

<sup>5</sup> In this statement the strong influence played by Hindu religion and culture is quite evident. One of the most beloved Hindu deities, Śiva, is also known by the epithet 'Nīlakhanta' ('blue-throated one') because he magnanimously keeps in his throat the poison that was meant to destroy mankind.

find the term '*alark*', which is translated as 'a fabulous animal' and, more specifically 'a mad dog' (Turner 1999, 31). In Sanskrit, '*āla*' means not only 'poison' and 'discharge of poisonous matter from venomous animals' but also 'source of pain' (Turner 1999, 61).

Warrell (1977, 37) perfectly describes the fear that a dog bite can evoke in people: 'No wonder that, amongst less resilient personalities, extreme anxiety may lead to symptoms of hysterical pseudorabies. In countries where rabies is endemic the mental anguish resulting from possible exposure to infection cannot be measured in such simple terms as the incidence of the disease or the numbers of people vaccinated'. In addition to the absence of any efficacious treatment for rabies, its symptoms are so dreadful that they have long sufficed to justify the widespread terror of this disease. Compared to many other pathologies (such as plague, influenza, smallpox, etc.), rabies has never reached pandemic dimensions or killed millions of people. However, in the past it was not uncommon for a person bitten by a dog suspected of being rabid to commit suicide, and 'the fear of rabies was such that often persons even suspected of hydrophobia were killed like wild animals . . . shot, poisoned, strangled or suffocated' (Wictor 1985, cited in Gomez-Alonso 1998, 858).

Several factors contribute to foster the dread of this pathology. First of all, in India as well as in many other parts of the world the dog is the main vector of rabies. Since this animal is generally seen as a faithful pet in many societies, the fact that it can turn into a lethal danger is a source of deep anxiety in people. This traumatic experience is the reason not only for the indiscriminate mass killings of dogs that regularly occur in India, as well as abroad, to try to solve the problem of rabies at its source, but also for the broadest dread for this pathology.

Secondly, the onset of rabies is not always predictable or independent of a wide range of concurrent variables. The effects of a previous (maybe unknown) vaccination in dogs as well as in humans can hinder the onset of the disease. Moreover, rabies has an extremely variable incubation period that causes much stress in the people who have been exposed to rabies, since it can keep their lives pending for more than one year, without any certitude about the future.

This worrying situation is further aggravated by a third fact: rabies cannot be diagnosed ante mortem. Although its symptoms are evident and quite characteristic (especially the combination of them), no medical test can officially attest to the actual presence of this disease. Consequently, before death diagnosis depends only upon the skill of physicians to recognize this pathology. However, since from the outset of the first specific symptoms of rabies to the moment of death the days left to the victim are not many, it is likely that sometimes there is insufficient time for the victim's family to obtain a diagnosis, which, although provisional, could answer their questions and ease their suffering.

Fourthly, as already mentioned, the symptoms of rabies are brutal and shocking, since before causing physical alterations they deeply affect the central nervous system and provoke appalling behavioral changes in the person who just before was behaving normally. Moreover, once the symptoms become evident, rabies is incurable.

Finally, in India rabies kills particularly in rural areas, where lack of health education, logistical hindrances, financial constraints, the poor quality of medical infrastructures, and a lack of quality medical education often hamper prompt and effective health-seeking behaviors. Unfortunately, only scanty data on rural rabies is available, but according to a study carried out in New Delhi in 2004 (Chhabra et al. 2004, 219), 99 percent of patients who had sought medical care after a bite from a potentially rabid animal did not receive appropriate (according to WHO standards) wound care and vaccination. It is not surprising, then, that a large majority (78 percent) of rabid patients prefer to leave the hospital and to die at home. The palliative care that would lessen their suffering towards the end is not available at home, and so patients' relatives are left alone to impotently face the most traumatizing effects of rabies. This situation of medical negligence and incompetence couples with the scary features of rabies and represents a fertile ground for the belief in puppy pregnancy to strengthen and gain success in people's frightened and puzzled minds.

### A possible explanation: Fear and skepticism towards vaccination

Trying to find a plausible and convincing explanation for the belief in puppy pregnancy is anything but easy, for many reasons. Firstly, to my knowledge no other ethnographic reports document this phenomenon. Secondly, this belief is not widespread, since only a small number (about ten individuals) of the people I spoke with held this belief. In other slums that are not considered in this article, I did not find a single case of belief in this pregnancy, but only incredulous laughs at it. Thirdly, there appears to be no halfway point between the people who strongly believe in this idea and those who never heard of it; I did not meet anyone who is aware of this belief but is still cautious or skeptical about the phenomenon. In New Delhi I never met such a person with whom to share my views, not even within the medical environment. As a matter of fact, I met several doctors, nurses, and medical officials who work in the field of rabies prevention or who offer first aid to victims of animal bites, but I never came across anybody who had even heard of this belief.

Some cultural elements, discussed below, add useful information to support my hypothesis that the belief in puppy pregnancy is based on the fear and mistrust of antirabies vaccination. After the pioneering achievements of Louis Pasteur in the nineteenth century, two kinds of post-exposure vaccination have been available for human use: the nervous tissue vaccine (NTV) and the cell culture vaccine (CCV). The CCV is more recent and efficient, and its

shots are given intramuscularly or intradermally in the deltoid region in four to five doses over four weeks. It was created to replace the NTV, the use of which was discouraged by the WHO in 1983. NTV requires fourteen painful injections into the abdomen with a large-bore needle, and has a high rate of adverse side effects (from abdominal swellings to neuroparalytic complications that can sometimes be life-threatening) and lower efficacy (Garg 2014, 139). In contrast, CCV is comparable to flu shots in terms of pain and side effects. Soon after 1983, the NTV was abandoned in many countries, but in India its use continued for more than two decades, particularly in the public sector, because of its cheapness and availability. Modern CCVs were introduced in the early eighties, and from 1995 onwards their use constantly increased, even if due to their high cost they could be afforded only in private clinics by wealthy patients. In India NTV production and use were officially discontinued, and replaced by CCV, only in December 2004 (NCDC 2013, 11).

During my interviews in the slums of New Delhi, the number of injections required by the NTV was well known to adults: ‘*chaudab kutterāli* injections’, ‘fourteen dogs’ injections’ (Fatima, female, from Bihar, forty years old). The feeling of stress that this number provokes in adults is so strong that even the youngest generations now know it by heart: ‘*chaudab, kam kabhi nahi, chaudab*’, ‘fourteen, never less, fourteen’ (Jivan, male, from West Bengal, twelve years old). In most of the cases, the speaking of this number was accompanied by gestures that demonstrated the length of the needle (exaggerating it, understandably) and its excruciating plunging into the abdomen.

It is not difficult to understand how the painfulness and length of the NTV treatment have contributed to amplify the terror of rabies in people, but I think that for this disease, and only for it, injections in the abdomen reinforced the belief in puppy pregnancy. As a matter of fact, in India, as well as abroad, most vaccinations are administered orally or through injections in the arm or the gluteus. But in India rabies was long an exception to this rule. It is possible that because of the uncommon site of NTV shots people have become convinced that rabies lurks in the abdomen. The statement by Amina, reported above, seems to provide empirical support to this thesis, when she said that the woman delivered ‘fourteen newborn little puppies’. A litter of fourteen puppies would not only be quite large, and thus uncommon but also, and not by chance, this is the same number of the injections prescribed in the vaccination course with NTV.

Although nowadays India is aligned to international standards, the fact that NTV has not disappeared from patients’ memories and practices is evident. According to a study carried out in 2001–2002 in New Delhi, 61 percent of the patients who received post-exposure prophylaxis were treated with NTV and not CCV (Lal et al. 2005, 53). Moreover, most of these vaccination therapies and the pain they caused have been ineffective, since in 54

percent of the cases the number of boosters was inadequate. A study carried out in 2001–2002 in several other Indian towns found that the common use of the NTV curbed people from seeking medical intervention after a dog bite, due to the fear of the pain they would have to bear (Ichhpujani 2006, 359). In the list of the reasons for avoiding the post-exposure vaccination, the fear of the multiple painful injections in the abdomen ranked first (32 percent), followed by ignorance (the term used by the authors of the survey) and negligence (31 percent), cost (15 percent), and the length of the treatment (6 percent). Thanks to this investigation, it also emerged that people's awareness of the number of injections needed to fight rabies is deeply biased by the memory of the NTV, a practice that should have ceased by the time of the study, since the WHO had discouraged its use nearly two decades earlier. Respondents variously stated that the number of injections needed was (a) between seven and thirteen (30 percent of the respondents), (b) fourteen (26 percent), (c) five or six (10 percent), (d) seven or eight (7 percent), (e) between fifteen and thirty (5 percent), and (f) between twenty-one and thirty-two (2 percent). Less than one-tenth said that only five injections were enough, which shows quite clearly that existing awareness was of NTV and not CCV. Similarly, the number fourteen emerged again in 74 percent of the respondents' answers in a study carried out in Gujarat (Singh and Choudhary 2005, 82). Of course it is difficult to state whether this erroneous information resulted from actual exposure to NTV or only the fear it evokes, but it seems to be enough to deter people from seeking an effective post-exposure prophylaxis.

Let us also recall that what causes pain and suffering in the administration of NTV are not only the injections but also the side effects. According to a study carried out in 1997 (Kale 2006, 25), the most common reactions following NTV were local reactions, including redness in 90 percent, swelling in 80 percent, pain in 27 percent, and itching in 19 percent. Paradoxically the use of NTV, rather than CCV, was higher in the big urban centers than in the countryside (56 percent against 44 percent; APCRI 2004, 28). However, fear of painful NTV doses was listed second among the reasons for not seeking proper health care after the bite also in rural Odisha (Satapathy 2005, 241).

## The role played by the cultural milieu

Even though I am persuaded that the fear of the NTV prophylaxis is at the basis of the belief in puppy pregnancy and that this belief is thus a quite recent phenomenon, I also think that a more ancient cultural background allowed the creation of this conviction and gave it a sort of cultural legitimization. Some pertinent cultural and religious elements, belonging to Hindu and Muslim milieus, are presented in the following paragraphs.

Several studies (Bollée 2006; Foltz 2007; Lodrick 2009; Menache 1997) have already shown the particular cultural disdain for dogs from Hindu and Muslim perspectives. In Hinduism, dogs usually rank last in the animal hierarchy and thus are considered the most impure species. As Doniger O’Flaherty (1976, 173) observes, ‘the dog being to the cow in the world of beasts what the outcaste is to the Brahmin in the world of men’. In the *R̥ig-Veda* (10.14.10–12) of the, the dog is associated with Yama (the Hindu god of death) and in most of the ancient Vedic literature it is described as black, a very inauspicious color in Hindu symbology (Bollée 2006, 17). The Cāndogya Upaniṣad highlights a clear relationship between sin and dogs (Nelson 2006, 185), while in the Yogabhāṣya 2.33 Vyāsa uses the fact that these animals often eat their own vomit as a metaphor to exemplify the behavior of those who repetitively make the same mistake or are continuously tempted to (Nelson 2006, 182–83).

Given the broad geographical diffusion of Muslim culture it is not possible to state the existence of an unambiguous Islamic disdain for dogs. However, it cannot be ignored that dogs, as well as pigs, enjoy very little respect within this cultural milieu. In fact, addressing someone with the expression ‘child of a dog’ is among the worst offenses for a Muslim (Foltz 2007, 132). Within Islam dogs, particularly black dogs (Menache 1997, 34), are associated with death and thus are considered the first emissary of devil (Taylor 2005, 77). At a popular level it is thought that if a dog (especially with black eyes or fur) passes by a man who is praying, all his prayers are made fruitless by this encounter (Foltz 2007, 129–30). If the dog touches him, consequences are even worse. Its hairs and saliva are not only dirty but ritually impure (*najis*), so according to the Muslim hadīth<sup>6</sup> 279 coming into contact with them makes it necessary for adherents to scrub themselves seven times before praying again.

Ideas about dogs’ saliva within these two cultural environments deserve particular attention. Within Hinduism not only dogs but also their saliva are seen in an ambivalent way. In the ancient Sanskrit literature (*R̥ig-Veda* 9.101.1, 13) ‘the long-tongued selfish dog is seen as a friend so near that he pokes his too familiar head into the dish’ (Hopkins 1984, 155). At a popular level it was believed that dogs’ tongue and saliva had extraordinary curative powers, supported by the observation that when dogs lick their wounds they are able to eventually heal them. Hence, letting a dog lick an open wound, particularly on Tuesday and Saturday (the days devoted to Bheru, a deity associated with dogs), was considered an effective method to cure infected lesions (Lodrick 2009, 513). At the same time, saliva is seen as one of the most polluting secretions, and since dogs are looked at as the most impure animals,

<sup>6</sup> Hadīth are reports describing the Prophet Mohammed’s deeds, declarations, and thoughts, often integrated with commentaries. This broad and often discordant body of literature is based on spoken reports that were in circulation after the death of Mohammed and that were gathered over three centuries.



their saliva is theoretically abhorred. In the Islamic context, the soiling nature of dog saliva was enough to order the killing of all dogs found in human settlements (Menache 1997, 35). To understand the fear of dog bites, rabies, and the possibility of an unwanted pregnancy it is interesting to consider how and when this measure was implemented.

In the pre-Islamic period the dog was the only domestic animal to have a personal name and in the Koran (*sūra* 18) the only reference to this species is positive (Menache 1998, 83). Much later, for example in the fourteenth century, the ruler of Damascus, in Syria, ordered all the dogs in town to be killed. Although a religious tenet was used to justify this measure (as the Bukhari Ḥadīth 4.448 reads, dogs' presence in houses prevents angels from entering them), it is likely that this measure was based on the practical need to protect public health from rabies. In fact, in the crowded walled cities of the Middle East the proximity of stray dogs to humans was considerable, as well as the incidence of rabies and the awareness of the disease and the measures to prevent it. This was the case particularly in the medieval period, precisely when the pre-Islamic liking for dogs gave way to their scorn and strict avoidance (Théodoridès 1984, 149). In fact, as the WHO still recommends, if no vaccinations are available (as at that time), the most effective way to control the diffusion of canine rabies is to kill all potential vectors. As Menache (1997, 35) writes, 'the readiness to carry out such massacres was unquestionably connected with the diabolic image of dogs, and, no less important, the danger of rabies'.

Although puppy pregnancy is de facto asexual, as no physical intercourse occurs between dogs and their victims, its etiology however contains clear references to one of the characteristics of dogs negatively connoted in Hindu and Muslim cultures: their sexuality. In ancient Hindu texts, dogs' sexuality is often described as unrestrained, craving, polygamous, and unusually frequent, so much so that with reference to dogs the Sanskrit terms '*a-rata-trapa*' ('not ashamed of coupling') and '*dīrgha-su-rata*' ('long in coitus') are not inappropriate (Bollée 2006, 10).

The topic of the uninhibited sexuality of dogs is clearly reflected in current Hindi. The term used to voice this concept during my conversations about rabies with my informants in the slums of New Delhi is '*bīj*'. By '*bīj*', the people I spoke with meant the agent responsible for the pregnancy or, in other words, the fertilizing element that, penetrating the human body through teeth, gives birth to the puppies in the abdomen. It is interesting to note that the word '*bīj*' has several translations in English, which can be divided into two different, although near, semantic clusters. On the one hand it can be translated as 'cause', 'source', 'origin', 'nucleus', and 'kernel', while on the other hand it can also be used with the meaning of 'seed', 'embryo', 'ovule', and 'sperm'. Both semantic clusters visibly stress the concepts of fecundity and fruitfulness embodied in the term '*bīj*'. However, this idea is expressed not only at a linguistic level but also through religion. For example, in Hindu mythology and

religion Raktabīj is a particularly powerful demon who is able to be reborn by multiplying himself from every drop of blood that pours out of his body. This drop embodies a reproductive potential that can be found only in spermatic liquid.

The idea of a poison that lies in dogs' teeth and enters the body of the victim through the bite can be found in Indian medical culture in the *Suśruta Sambhitā*. According to the author of this text, 'the poison of a (rabid) dog, etc., lies in the teeth' and the first clinical sign of rabies is the fact that patients start to lose the sensitivity of the area around the bite, from which black blood, because of its mixing with poison, starts to come out (Bhishagrajna 1991, 736). In the *Suśruta Sambhitā* rabies is also called '*alark viṣ*': '*viṣ*' means 'poison', while '*alark*' can be translated as 'mad dog' or 'that [which] is caused by a mad dog' (Turner 1999, 31). '*Ala*', within the term '*alark*', means 'poison' or, more specifically, 'toxic substance coming from a poisonous animal' (Turner 1999, 61).<sup>7</sup> It is interesting to note that in the *Mahābhārata*, *Alarka* is a worm with eight feet, acuminated canine teeth, and stinging hairs.<sup>8</sup>

The anxiety from the idea of the body being poisoned following a dog bite emerges clearly also in a study carried out by Chaudhuri (2015, 3) in a rural area of West Bengal. Questioned about the consequences of an animal bite, 21 percent of the respondents said that it could cause rabies, while 30 percent claimed that it could lead to 'poison in [the] human body', which sometimes ascends to the brain.

Within Islamic texts, the first reference to puppy pregnancy comes from the *Uyun al-Akhbar*. This text reads that if a rabid dog bites a person it makes him pregnant, fertilizing him with tiny puppies, whose features are clearly visible in the blood clots that develop in the victim. The danger of death, which was thought to be there for forty days after the bite, was over only if within this period an animal came out from the private parts of the bitten person (Menache 1997, 36). In the 1880s, according to the Italian geographer Cecchi (1886), a similar belief was also widespread in the Shoa region of Ethiopia. Cecchi (1886, 441–42) quotes an observer from the region:

<sup>7</sup> Incidentally, the modern term 'virus' comes from the Latin '*virus*', which means 'poison', 'sap of plants', 'slimy liquid', and 'potent juice'. Cognate words are the Sanskrit '*viṣam*' ('poison') and '*viṣab*' ('poisonous'), the Latin '*viscum*' ('sticky substance'), and the Greek '*ίός*' ('poison').

<sup>8</sup> However, also in Greek the term '*lytta*' is associated with the worm and the mouth, particularly the tongue. In modern English the word '*lytta*' indicates the lingual frenulum in dogs and other carnivores, while in the past it was thought that *lytta* was a worm under a dog's tongue that causes rabies. Until the nineteenth century a common solution to prevent rabies was the removal of part of the lingual frenulum of dogs, where the worms of rabies were thought to be (Steele 1975, 2).

‘When an unfortunate was bitten by a rabid dog this produced in his belly puppies which grew day by day, and ended by suffocating the patient’. The same observer adds that the patient would be given some herbal medicine as an emetic, and, each time he vomited, there would be a discussion among the persons present as to the part of the canine animal that had been ejected. One person, he says, would claim to recognize a leg, another a shoulder, a third a part of the breast, and the discussion would be halted only when the practitioner gave his own equally naive verdict on the matter.

### An alternative explanation: A culture-bound disorder

In 2003 in the *International Journal of Social Psychiatry* a short article was published, in which a group of scholars coordinated by Chowdhury (2003, 35) described the symptomatology of the disorder they refer to as a ‘delusion of animal pregnancy in humans’. The seven cases they describe in detail include one boy, one teenage girl, and five young men and women, of both Hindu and Muslim faiths, who live in a rural community located forty-eight kilometers from Calcutta. In the same area, the researchers further investigated this topic by interviewing forty-two randomly selected adults (twenty-seven males and fifteen females), and conclude: ‘73% believed [in puppy pregnancy] with definite certainty; 14% were ambivalent; 9% discarded the concept and 4% had no opinion’ (Chowdhury et al. 2003, 41).

Despite the firm idea that the moment of conception happens in the contact between the victim and the dog, the exact modality of conception was anything but clear and unanimous among the respondents in the psychiatrists’ research. Some thought that a mere scratch is enough, while others claimed the necessity of a bite through which the animal’s teeth insert the seeds from which the puppies will eventually develop in the body of the victim. Moreover, as explained by a traditional healer interviewed by the researchers, not every bite actually causes pregnancy, because it is essential that the victim is also hit by a hostile supernatural influence, such as an evil eye or adverse planetary positions.

According to the data available to the psychiatrists, primarily through the self-reports of those experiencing puppy pregnancy, the first signs of this pregnancy are tiredness, nausea, frequent and painful micturition, weight loss, stomach acidity, excessive flatulency, and abdominal pain. However, its most typical and disturbing symptoms are the sensation of fetal movement and the clear sound of puppies softly barking in the abdomen. The most frightening aspect of this pregnancy, though, is that it invariably leads to death, due to the infection caused by the fetuses. Consequently, it is vital that puppies are expelled from the body before they grow too much. This is important particularly for men, since the expulsion of fetuses will eventually occur through the urethra, causing excruciating pain and deep

lacerations; the male respondents of the study by Chowdhury and colleagues (2003) demonstrated a deep concern for their urine for this reason. Its reddish color was thought to indicate the presence of blood, resulted from urethra laceration, while the presence of tiny black dots, thought to be the dead fetuses, signaled their expulsion and served as the long-awaited proof of the end of the pregnancy.

Local traditional healers who are specialized in the treatment of this pathology intervene precisely to facilitate the quick ejection of puppies. In addition to performing ‘special chants’ (Chowdhury et al. 2003, 41), these healers administer local herbs that kill and dissolve the fetuses and allow their painless expulsion. The timeliness of this treatment is of paramount importance, since if it is deferred for more than one week from the onset of symptoms, the risk is there that the puppies will grow too large and start moving in the abdomen, terrorizing the victim who thus also begins to manifest behavioral alterations, such as hallucinations, agitation, restlessness, and hydrophobia.

Even though further psychiatric investigation revealed that an obsessive-compulsive disorder was also present in two cases described by Chowdhury and colleagues, and an anxiety-phobic locus in another one, in the other four cases, the authors write, ‘no other mental symptom except this solitary false belief and preoccupation about the puppy pregnancy’ was there (Chowdhury et al. 2003, 35). This prompted the researchers to conclude that puppy pregnancy is a culture-bound disorder. Although the concept of culture-bound disorder, or syndrome, is quite debated, by this term the medical community usually means a combination of psychiatric (behavioral) and somatic symptoms that clearly identify a disease within a specific culture or society (Lloyd 2007, 100). A culture-bound syndrome is not a geographically localized disease with specific, recognizable abnormalities or a genetic condition limited to certain populations. The American Psychiatric Association (2000, 898) defines culture-bound syndromes as ‘generally limited to specific societies or culture areas and are localized, folk, diagnostic categories that frame coherent meanings for certain repetitive, patterned, and troubling sets of experiences and observations’. Some culture-bound disorders may have similar features in different cultures, but usually they have locally specific traits. Since 1994, the term is included in the *Diagnostic and Statistical Manual of Mental Disorders*, which describes a culture-bound syndrome as characterized by the following features: it is categorized as a disease in the cultural area; there is no objectively demonstrable biochemical or physical symptoms; there is a widespread diffusion within the cultural area; and there is a complete lack of awareness about it in other cultures. Since this concept is still highly controversial within the international medical community, culture-bound syndromes are usually recognized and treated only at a local level, typically by local healers and according to local systems of medicine.

According to Chowdhury and his colleagues (2003), the evidence that puppy pregnancy syndrome is a culture-bound disorder is the illustrative case of the youngest patient of these psychiatrists, an eleven-year-old boy. The social imposition of the cultural belief in puppy pregnancy had been so strong on him that he pretended to have suffered from it and to have vomited out a puppy fetus that he had simply found at his neighbors' house, where their dog had just had a slink (prematurely born puppy). The neighborhood interest in his condition pressured this boy to conform to their ethnomedical theory about puppy pregnancy.

## Conclusions

The conclusions that I am going to draw here can only be preliminary, as the ethnographic material this article is based on is as limited as it is interesting, given the small pool of informants I have spoken with and the consequent shortage of ethnographic detail regarding the circulation of stories about puppy pregnancy, particularly in the area they seem to come from (central-eastern India). Nevertheless, because of the originality of this topic and its importance within the broader matter of rabies management – in which fear plays a key role – I think that the effort of providing some first and tentative speculations about the belief in puppy pregnancy is worth doing. That said, further research and debate are undoubtedly hoped for.

Rabies is probably the oldest disease known to humankind and this primacy has given to this devastating zoonosis ages to penetrate people's imagination and to become a cause of one of their most distressing fears. This is greatly facilitated by the unique and frightful features of rabies, such as its deceitful symptomatology, its prolonged agony without the reassurance given by a diagnosis, and its unavoidable death. The social alarm prompted by rabies has pressed not only physicians and scientists but also laypeople to create beliefs about it.

According to the group of psychiatrists led by Chowdhury (2003) the delusion of puppy pregnancy meets the criteria for a culture-bound syndrome. In their view, this syndrome can be seen as the result of an emotionally fuelled collective attempt to explain rabies. As evidence of this syndrome, traditional healers have become specialized in its treatment and have developed a mixture of healing herbs and magico-religious formulae that has proved, according to them and their patients, to work successfully. Most people in the villages in the research by Chowdhury and colleagues could report the case of at least one person 'in a nearby village' whose death was clearly the result of puppy pregnancy. On the basis of this apparent evidence, it is easy for individual and collective ruminations about this pregnancy to continuously nourish themselves, eventually exaggerating the issue.

But defining puppy pregnancy as a culture-bound syndrome is problematic, at least formally. According to Gold and Gold (2012, 12; see also Kirmayer 2007), who explicitly mention the puppy pregnancy syndrome, ‘there is reason to be sceptical about the coherence of this theoretical construct’. What these psychiatrists claim is that while cultural studies have important contributions to make to the cognitive theory of delusion because particular delusional ideas are sensitive to, and strongly shaped by, culture, the broad categories of delusion are stable both across time and culture. Delusions, therefore, are not bound to culture. Conversely, culture is ‘pathoplastic’, meaning it can shape delusional contents, but is not ‘pathogenic’, meaning it does not create new forms of delusion (Tseng 2001, 178). For example, Suhail and Cochrane (2002) note that Pakistanis who have migrated to the United Kingdom exhibit delusional forms that are more like those of their new compatriots than those in their country of origin. Nevertheless, despite their critique of a culturalist explanation for delusions, Gold and Gold (2012) encourage cognitive neuropsychiatric theories of delusion to take into account the key role of culture in the shaping of delusional ideas. The explanatory frameworks developed in the late 1970s (for example Kleinman 1977) and further revised in the 1980s (for example Young 1982) are still well suited for medical anthropological research in the fields of cultural epidemiology and cross-cultural psychiatry, particularly when they are complemented by attention to social phenomena and other contextual forces that influence health and illness (Weiss and Somma 2007).

Going back to internal delusional zoopathy (a condition in which the sufferer believes their body, or a specific part of it, is infested with animals), Ermacora (2015a, 2015b) and Ermacora and colleagues (2016) provide consistent evidence of the existence of this recurring pattern both from a diachronic and synchronic perspective. As far as India is concerned, the puppy pregnancy syndrome is mentioned as one of the very limited cases in which dogs are protagonists of the disorder (see also Zacchia 1639, 380), along with many examples of other smaller species (especially insects) painfully invading the human body. In a brief but remarkable comparative account, Cusack (2016, 113) writes that ‘some American children could fear or experience puppy pregnancy after being sexually abused by humans and trained dogs’.

While I don’t reject the conclusions of Chowdhury and colleagues (2003) on the whole, I believe that a more historically situated theory should also be considered as a possible explanation, in which the fear of painful NTV injections in the abdomen could have given rise to the conviction in puppy pregnancy. Further research, hopefully geographically situated in central-eastern India where this belief appears to be rooted, is needed to shed more light on this unique entanglement of human bodies, animal bites, dog puppies, and rabies vaccination. What can be tentatively said at present is that a notion of puppy pregnancy has developed in relation to dog bites, and that such puppies can be killed

through in-depth injections in the abdomen, precisely where NTV shots were administered. If this hypothesis is plausible, now that NTV is banned and CCV has replaced it, it is possible that this belief will lose its strength.

However, even if the shift from NTV to CCD has already reached an important stage, it involves several challenges. Since the discontinuation of NTV in December 2004, most government hospitals in India have faced acute shortages of modern rabies vaccines. This has been due to limited budgets and the fact that intramuscular CCVs are expensive. Thus, the solution has been found to replace intramuscular (IM) CCV with intradermal (ID) CCV. The immune response induced by ID CCV is adequate against rabies and the use of this route leads to considerable savings in terms of the total amount of vaccine needed for a full post-exposure vaccination series. These intradermal regimens are of particular interest in all countries where NTV was usually administered to the poorest segment of the population. Nevertheless, challenges exist even with this vaccine. IM CCV is easy to administer and less painful, while ID CCV shots are more time consuming, more challenging technically, and more painful. ID CCV thus requires a higher specialization and skill in the medical staff, as well as a higher endurance in the patients. Moreover, ID CCV clinics may be more scattered because their staff is more specialized. In these clinics, reconstituted vaccine vials have to be used within eight hours if kept in a fridge, otherwise in the same hour, which means that vials will be wasted if the number of patients attending each day is fewer. Despite these challenges, the merit of the ID CCV is that it is more affordable. In fact, it is usually said to be a 'pro-poor' vaccination, particularly in those countries where the gap between poor and rich is wide, as in India, and where diseases kill mainly among the poor, as with rabies. On the basis of this, rabies and unwanted puppy pregnancy may have a hard future ahead.

## About the author

After earning a BA in Hindi and a MA in cultural anthropology, Nadal completed her PhD in anthropology with a thesis on street animals in urban India in 2014. Thanks to a Hunt Fellowship from the Wenner-Gren Foundation, she is working on the publication of her first book. In 2017 she was awarded a Marie Skłodowska Curie Fellowship from the European Commission to study rabies in rural India. Her research interests include human–animal relations, infectious diseases, public health, and ethnoveterinary medicine.

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