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# Fifth Koro epidemic in India: A review report

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**Abstract.** *A massive Koro epidemic has hit India again in 2010. It affected four States, viz. Assam, Maharasthra (Mumbai), West Bengal and Tripura. This is the fifth Koro epidemic in India. The present paper deals with the study of 55 epidemic Koro cases of West Bengal. The different aspects of the epidemic including clinical presentation, sufferer's health seeking behaviour, explanatory model of Koro illness and folk treatments are discussed from transcultural perspective. A future preventive public health strategy of such an epidemic is also discussed.*

**Keywords:** Koro epidemic, Koro perception, Explanatory model of illness, Indian Koro

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**INTRODUCTION** Outbreak of Koro is a well-known psychiatric epidemic in Asia-Pacific region. In India, first such epidemic occurred in 1968 in North Bengal region of West Bengal State, the second one in 1982 affected mainly West Bengal (Chowdhury *et al*, 1988) and Assam (Dutta,1983). The third mini epidemic occurred in a village in South 24 Parganas district of West Bengal in 1988. (Chowdhury *et al*, 1994). Fourth Koro epidemic took place in Tripura in 1998. This time the epicentre of the epidemic was Assam (Roy *et al*, 2011), then Mumbai, and then transmitted by migrant labourers to West Bengal (**Note 1**).

**THE BACKGROUND SCENARIO** On October 26th, 2010, *Mid-Day*, news daily in Mumbai reported: "Mass panic at labour camp in Goregoan as twenty-five men suffer from 'retracting' genitalia" (Ranga, 2010). The Aarey milk colony is situated in Goregaon East, Mumbai, and houses several labour camps, where people came to work from different parts of India. Mr Rai, one of the victims who came from Orissa said: "On Sunday night I experienced extreme heat emanating from my body. My genitalia were retracting and I was really worried. Later, on my friends' advice, I jumped into a tub of iced water and sat there for three to four hours". He also said that "We all are from Orissa, Bengal, Kolkata, but I have noticed that men from Orissa and Bengal are suffering the most" (Ranga, 2010). Another victim, who came from Assam said, "I am shivering because of the

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cold and the heat that is emanating from my body. But, I will sit in the water only... My relatives in Assam guided me on the disease and now I am feeling better". At least twenty-five other workers (all male) reported similar symptoms with most victims coming from West Bengal and Orissa states of India. These incidents created an air of panic in the camp. The news also received high publicity in other medias and blogs in Mumbai (Wellsphere, 2010; Now Public Staff, 2010) and also in Assam (Assam Tribune, 2010) and West Bengal (The Statesman, 2010).

Though no details were found about the index case at Aarey Colony, but it is worth noting that there was a mass scale Koro affliction reported from Assam, a north-eastern state of India, immediately preceding this incident in Mumbai. *Assam Tribune* on September 30th, 2010 reported: "Doctors have discounted claims and apprehensions about the reported outbreak of a disease that affects males and females in peculiar ways. Senior doctors in Gauhati Medical College as well as those working in the rural interiors have rubbished reports which indicate that some males have seen their genital organs retract into their abdomen; while females have experienced the same with their breasts". It also pointed out that the medias are over-reporting and thus helping the spread of the illness. Duarah (2010) reported how this epidemic speeded inside rural Assam and how people from all walks of life were adhering to the folk preventing rituals: "Quite unfortunately, the local media hype regarding this syndrome has created an uncalled for situation that has put every educated individual to shame. On a tour around the bustling capital city, …one will bump into all sections of people with lime smeared on the ear lobe in an effort to shield oneself from the 'dangerous disease'. Right to the well dressed men and women to the salesman in a sleek mall and the daily wage labourers, everyone is sporting lime spots on their ears and the more paranoid ones are immersing themselves in water holes".

October is the month of Great festival of *Durga Puja* for Hindus and *Ramadan* for Muslims. Usually the labourers get leave from work during this time and visit their native homes. It is certain that few of these affected persons in Aarey Colony were from West Bengal and they returned to their homes during the festival leave.

# METHODS

### The West Bengal scenario

From the first week of November, 2010, several districts of West Bengal were affected, namely, Darjeeling (Siliguri) and West Dinajpur. At least four thousands people were affected in those districts (Bera, 2011; Chakraborty, 2010). The present report is based on the study of patients from Kolkata and adjoining districts.

### The cases

The Koro outbreak has been reported from certain areas of Kolkata as well as from the neighbouring districts. The peak wave stayed from last week of October to 1st week of December, 2010. A total of 60 cases had attended the Emergency and other outdoor departments of R.G.Kar Medical College (a teaching general hospital), Kolkata, and later referred to Psychiatry department for detailed assessment and management. Five cases were not Koro, hence are not included in this study. The demographic distribution of 55 cases is shown in **Table 1**. This account (from patients and accompanying family members and neighbours) contains the salient clinical features, beliefs regarding the illness and different folk therapeutic measures adopted by the affected and non-affected persons. Written consent from each patient was obtained to publish their data unanimously. Diagnostic assessments were done following ICD 10 criteria (WHO, 1991). The study was carried out from November 2010 to January 2011.

**Table 1** Distribution of Koro cases (n= 55)

| AREA (% of cases) | AGE RANGE (Years) | AGE RANGE (Years) | | RELIGION | | MARITAL STATUS | |
|---|---|---|---|---|---|---|---|
| | | Male | Female | Hinduism | Muslim | Single | Married |
| North 24 Pgn. (54.54) | 9-42 | 30 | 0 | 5 | 25 | 10 | 20 |
| South 24 Pgn. (30.90) | 16-35 | 15 | 2 | 14 | 3 | 4 | 13 |
| Howrah (3.63) | 21 | 2 | 0 | 2 | 0 | 0 | 2 |
| Kolkata (10.90) | 23-35 | 5 | 1 | 6 | 0 | 2 | 4 |
| TOTAL | | 52 | 3 | 27 | 28 | 16 | 39 |
| ***Total %*** | | 94.5 | 5.5 | 49.1 | 50.9 | 29.1 | 70.9 |

# RESULTS

## Clinical presentation

All male patients had presented with the symptoms of acute penile shrinkage and retraction along with pain and pulling sensation in penile region. A 'Flu-like' syndrome with fever (described as 'Disco fever'), tremor, headache, burning sensation all over body with increased temperature over lower part of body below the waist, sweating and dryness of throat, has been reported by 80% of the cases. Since, the common form of self-medication practiced by most patients was submersion in cold water upto the level of neck for long hours; some patients felt that the fever and associated symptoms could have been a result of such therapy. The acute penile pull was described as sudden retraction with pain in lower abdomen that lasted for 10-15 minutes with resultant shortening of the penis (in 7.7%, shortening /reduction of the scrotum also). 95% cases reported one attack but 5% had several attacks (2-3) on the same day. One male patient also reported shrinking feeling of both arms, legs and ears (as if there is a pull from inside) along with penile symptoms.

Associated fear of impending death was reported in 43.6% cases. Remaining cases had the fear of 'dissolution' of their male organ. One patient was fearful of dying due to the severe respiratory distress and palpitation, rather than due to his penile retraction. Other complaints, among all patients, in order of frequency were difficulties in micturition (74.5%), heat emanating from the head and body (67.3%), generalized body weakness (54.5%), breathlessness (47.3%), vertigo (20%), and pain in the genital area and lower abdomen (7.7%). More than one symptom was reported by many patients. Among the male patients complaints of frequent loss of semen through urine (Dhat syndrome) was found in 8 cases (15.38%). Erectile dysfunction (11.5%) and masturbatory guilt with intense anxiety regarding future sexual life (5.8%) was also reported. The two female cases however did not have such associated sexual anxiety; their concern was more focused on disfiguration of their body and fear of some future serious malady.

A 9 year-old male child was brought by his parents to the hospital with symptoms of shrinkage of penis along with pain abdomen. The shrinkage was confirmed by his anxious mother. The child had been watching a Hindi action movie on television, when he suddenly felt his penis was shrinking. On questioning, he revealed that few days back he had heard discussions in the neighbourhood about a recent illness of penile shrinkage.

Two female cases had symptoms of retraction of nipples. One case also reported an associated 'peculiar sensation' in vagina along with vaginal discharge.

## Socio-demographic features, assessment and treatment

***Residence*** 75% were from urban area in and around Kolkata and 25% had a rural background.

***Literacy*** Most of the patients were illiterate or had only primary education. Only one male patient was a graduate.

***Occupation*** Except for two males who were students, most patients were either unskilled or semi-skilled labourers. Females were house-wives.

***Addiction*** 95% patients had the habit of using tobacco (either smoked bidi or cigarette or oral tobacco – *Khaini).* Harmful use of alcohol (F10.1) was found in 21.15% cases, of which 27.27% persons fulfilled the criteria for Alcohol Dependence (F10.24). Regular cannabis use was found in 3.84% cases, though occasional use of alcohol and cannabis was reported by 30.76% patients.

***Mental State Examination*** On MSE, 80% patients had moderate to severe anxiety, mean HAM-A score 22.70 ± 3.52 (Hamilton, 1959) regarding the illness especially its outcome. One male patient presented with severe agitation with symptoms of Acute stress reaction (F43.0), fearing some fatal bodily ailment and imminent death. Hypochondriacal preoccupation with genital symptoms was seen in 56.4% cases along with associated moderate to severe depression, mean HAM-D score 21.42 ± 2.46 (Hamilton, 1960). One male patient (with comorbid Dhat Syndrome) had strong suicidal ideation. Definite features of Body Dysmorphic Disorder (F45.2) regarding penile size and disfigurement was seen in 5.8% male patients.

***Past psychiatric history*** Excessive emission of semen via urine (Dhat syndrome) before the attack of Koro was the most common complaint (15.38%) - six were Hindu and two were Muslim, age mean 21 ± 3.7 years and all were single. Among these Koro with Dhat syndrome cases three cases met the criteria for diagnosis of Depression (one with severe depression without psychotic symptom – F32.2, two with Moderate Depressive Episode with somatic syndrome- F32.11); one with Generalised Anxiety Disorder (F41.1) and two with Mixed Anxiety and Depressive Disorder (F41.2). Two cases with Hypochondrical disorder (F45.2), one of which with Body Dysmorphic disorder F45.2 (firm conviction and high concern about physical appearance, mainly small size of penis and scrotum, bordering onto delusional belief of having a small penis). The last two cases had history of multiple health consultation, both modern and traditional. Even though all Dhat syndrome cases had acute anxiety with perception of penile pull, none had fear of impending death. Excessive masturbation and associated guilt were reported by 34.54% patients. Three patients (5.54 %) had anxious avoidant personality, F60.6 (described as 'mentally weak') and two cases (3.63 %) had obsessive –compulsive personality traits (F60.5). Four cases, three from Dermatology (two were receiving treatment for gonorrhoeal infection and had perception of penis shrinkage, and one had Herpes simplex infection (HSV2) with symptoms of feverish feeling, tingling sensation in penis with perception of intermittent retraction of penis and pain when passing urine) and one from Medicine department (of Dhat syndrome with extreme fear of 'penis-illness' from the current Koro epidemic) were referred. None of these patients had classical Koro symptoms like sudden onset, penile pull from inside, acute anxiety and fear of impending death. The case with HSV2 infection may be categorized as intermittent Koro-like symptom. One 7 year old male child was brought by his mother with the complaint of penile retraction. The boy had no complaint but the mother was firmly convinced that since that morning her son's penis gradually retracted and became "too small to grasp". There are some similar cases reported from her locality, she said.

***Treatment*** Most of the patients were treated with SSRI antidepressants (Fluoxetine, 60 mg or Citalopram 60 mg daily) and benzodiazepine (Clonazepam 500 mcg twice/thrice or Alprazolam 0.25/0.50 mg twice or thrice daily). Supportive psychotherapy in the form of reassurance was initially given to all patients. Two cases (severe depression and hypochondriasis) were offered more structured form of psychotherapy. Family members were also counselled. 18 cases attended follow up (up to 12 weeks) and all of them reported doing well with complete remission of Koro symptoms.

**Help seeking and explanatory model of illness**

All the patients had prior information about this illness (*Disco-fever*) mostly from neighbours and some through news papers. In one of the male patients the illness started after receiving a phone call from a friend who worked in Mumbai and who first informed him that such an illness was occurring at his workplace. Though he received the information with disbelief, after two hours, he felt his genitals shrinking. Another male subject went to help his friend who had a Koro attack and while pouring water on his head, he developed Koro symptoms. The mode of referral to this hospital was as follows: 43.64% Self referral, 36.36% by 'Quack doctors' (unregistered medical practitioners) and 20% by

Primary Care Physicians. 42.3% attributed their penile retraction and associated bodily symptoms to 'bodily weaknesses'. They also related this 'weakness' with 'body heat' as its consequence. 27.27% patients reported 'Viral infection' as a probable causative factor. They used the term 'Disco fever' to designate Koro symptoms. They believed that touching any person suffering from Koro would spread the disease. This belief created a panic atmosphere in that locality to such an extent that unaffected persons remained home-bound and did not even go out to work till the attack in the vicinity subsided. Interesting to note that this area evidenced large scale epidemics of Bird-flu (avian influenza from H5N1 virus) twice (2008 and early part of 2010). The concept of 'viral infection/fever' most probably has connection with these social experiences. One patient who vaguely associated his symptoms to AIDS, could not explain it in any more detail, but admitted to having had extra marital affairs and sexual intercourse with prostitutes. 21.15% cases believed excessive loss of semen, either by habitual masturbation or by sexual intercourse or due to weak *dhat* (semen), is the causative factor. Two cases reported that they had a prior suspicion and high concern that their penis was smaller in size than average, which they thought was a predicament for developing this illness now. Anxiety regarding future marital life was present in both the cases. One male patient felt that supernatural powers were responsible for such ailments and this was an indication that 'the world was coming to an end soon-by 2012.' He describes himself as an unfortunate target of this 'evil power'.

Therapeutic help adopted by the cases were: 74.54% initially consulted faith-healers, quacks, and local religious heads such as Priests or Moulavis, 25.45% consulted primary care physicians. Besides this, prophylactic folk measures were also taken by unaffected persons living in the same locality where the disease occurred.

Water Therapy: The most common therapy adopted by 95% of patients, was to submerge the body upto neck level in water usually in local ponds (**Figure 1**), holding the penis and pulling it for approx 30 mins to 6 hours. Later, cold water was poured or ice was placed on the head by family members. Besides this, 'cooling drinks' such as sugar water, medicinal water (prescribed by local faith-healers or obtained from places of worship) was taken to combat the *excessive heat* believed to accumulate in the body due to the disease.

**Figure 1** Water therapy to a Koro patient in a local pond (Bartaman, 2010b)

## Prophylactic folk rituals

***Herbal amulets*** Armlets, amulets and talisman containing medicinal herbs were also prescribed by Hindu priests and Muslim Moulavies for both, as therapeutic and prophylactic measure. It is reported that in Barasat town, 25 Km from Kolkata city, many people were affected by genital shrinkage illness (Bartaman, 2010a). A wave of mass-hysteria was observed, where people rushed to purchase chanted amulets to prevent the disease. Ginger and root of Arum (*Arum triphyllum*, locally known as *Mankachu*) was taken together, tied up in a piece of cloth to be worn around the waist, by a red thread. Crushed seeds of *Bottle-gourd* (*Lagenaria siceraria*, locally known as *Lau*) to be worn within an armlet was also advised. Manasa (*Sij* plant, belonging to the cactus family of *Euphorbia* genus), and Basil (*Ocimum*

*basilicum*, locally called *Tulsi*) leaves were taken together and tied up in a string at mid-arm position. Muslim patients were mostly prescribed the *Manasa* leaves whereas Hindus priests preferred *Tulsi*. *Tulsi* is regarded as a holy plant by Hindu religious tradition and is worshipped by Hindus at large. All these herbs and vegetables were sold at high prices locally at that time!

***Lime paste*** Lime (Calcium hydroxide) paste smearing on the forehead, throat and earlobes was also a popular preventive measure adopted by many patients and persons (**Figure 2**).

**Figure 2** Smearing of white lime paste on forehead and ear lobules by non-affected persons, (*Kolkata*; Bartaman, 2010b)

***Chanted paper*** In certain areas of South 24 Pgn. districts from where most of the Muslim patients came, papers containing lines from holy Koran were distributed by a local photocopy shop. The initial paper was given by a local Moulavi to the shop-owner. This created such an impact that some patients living in other areas, after hearing from friends over telephone about this therapy, rushed and procured the paper at high costs. The paper was meant to be inserted into the armlets and worn all the time to prevent genital symptoms. The idea behind this therapy was the belief that people who had developed the symptoms had sinful thoughts in their mind, but keeping these holy lines would redeem them from their sinful thoughts. Similar incidents was also reported from Barasat (Bartaman, 2010a) where one *Gunin* (folk healer) wrote a chant on a paper and advised to copy it and keep it within an amulet to wear and keep one copy at home to protect family members. There were long queues in front of different Xerox shops in Barasat town to procure a copy of this chanted paper. Usual cost of a copy was Rs.1 but at that time these chanted paper copies were sold at Rs.20-30.

***Herbal oil*** Another prophylactic measure adopted by some patients was to massage the penile shaft with massage oil (an herbal preparation called 'German oil', sold as an aphrodisiac over-the-counter). The preparation was sold in large numbers with an escalating cost.

## DISCUSSIONS

This Koro outbreak added some new clinical dimension to our understanding of psychiatric epidemic. Lessons learnt from this epidemic may be helpful in combating a future one. These are:

***The migration route of psychic infectivity of Koro*** It is evident here that the first epidemic focus was Gauhati, Assam, from where the epidemic spread to Mumbai (air distance of 2746 Km) and then to West Bengal (1662 Km from Mumbai). This inter-state spread was enacted through migrant labourers. During recent times, because of the easy transport, people have rapid movement to distant places and so is the psychic infectivity (similar to organic infection epidemic, e.g., trans-continental spread of Severe Acute Respiratory Syndrome- from China-Vietnam-Singapore-Taiwan-Canada etc). This is a new dimension of Eco-psychiatry (Chowdhury & Jadav, 2012) where rapid transit and information systems (media, television, fax, cell phone etc.) influence the quick spread of psychiatric epidemic over a wide geographical area (Colizza, 2009).

***Reporting of Koro from Muslim subjects*** In previous Koro epidemics from India no Muslim patients were reported. The involvement of Muslim persons and Maulavis in advocating religious treatment against Koro is a new finding. The present epidemic coincided with Ramadan fasting in

Muslim community and interestingly, a recent study reported "Ramadan fasting triggering koro-like symptoms during acute alcohol withdrawal: a case report from Oman" (Al-Sinawi *et al*, 2008). This area needs further research (**Note 1**).

***Cannabis, alcohol and Koro*** Though the cases mentioned in this report did not consist of either cannabis or alcohol-induced genital symptom, the relation between Koro and cannabis is well known (Chowdhury & Bera, 1994; Earleywine, 2001; Kalaitzi & Kalaitzi, 2006).

***Sexual psychopathology*** AIDS phobia (Chand, 1998), sexual guilt (Chowdhury, 1996a) and sexual preoccupation (Chowdhury, 1992a) of hypochondrical concern (Chowdhury, 1989a, 1992b), and generalised anxiety (Chowdhury, 1990a) or panic (Chowdhury, 1996b) are quite common comorbid psychopathology in Koro patients, and the same is evidenced among the cases of this epidemic as well. Hypochondrical concern about penile morphology or function is known to cause Koro vulnerablility (Rosentahl & Rosenthal, 1982). One case here had excessive guilt because of his long continued extramarital sexual involvement and was found to be quite apprehensive that some sexual deformity may result from his behaviour. The commonest precipitating factor (23.5%) reported among 162 Koro patients of North Bengal epidemic was 'extramarital intercourse' (Chowdhury, 1989b). Genital pain often accompanied a Koro attack (Wilson & Agin, 1997).

***Koro and comorbidity factors*** Empirical relation of any Culture-Bound Syndromes (CBS) with designated psychiatric disorder is very important (Guarnaccia & Rogler, 1999). The CBSs often coexist with other psychiatric disorder, as many psychiatric disorders do with each other. Delineation of comorbidity factor will help not only in clinical decision making but also in shedding light on the phenomenology of the CBS. Koro has offered a unique opportunity to study comorbidity in CBS, as over the years Koro has been reported from diverse culture and ethnicity with varieties of comorbid pathology, both mental and physical (Chowdhury, 1996c). Dhat Syndrome, a CBS reported from the Indian subcontinent, is based on the conviction that semen mixes with urine and is excreted through urination. It has a strong cultural belief that the loss of semen is harmful because it depletes the body of physical and mental energy (Akhtar, 1988). Dhat syndrome often has a complicated psychosexual loading with multiple comorbidities (Bhatia *et al*, 1997). In eight cases of Dhat syndrome with Koro here, different psychiatric comorbidities were found, which guides the clinical decision to treat these symptoms in addition to Koro complaints. These findings also help to develop insight into the psychodynamic psychopathology about sexual neurosis in the cultural context.

The child who was brought by his mother for alleged Koro symptom is an example of Munchausen by proxy, where the mother by fabricating symptoms (non-existing) tried to convince the medical providers that her child is sick. In psychoanalytical way she displaced her sexual anxiety onto the child. Similar cases have been reported from 1982 Indian epidemic (Nandi & Banerjee, 1986) and 1967 Singapore epidemic (mother came with a 4-months old baby) (Mun, 1968). A very similar epidemic scenario is reported from coastal Vietnam where some mothers observed that the penis and testes of their children had shrunk after swimming. This had created a social panic in a number of coastal communities and some mothers tried to pull out the penis and testes manually or even with hooks, which resulted severe penile injury in some boys (Kar, 2005a). Health professional should have insight about Munchausen or Factitious disorder by proxy (Ostfeld & Feldman, 1996) while dealing with alleged Koro in children, especially during epidemic times.

***Koro and Koro-like symptom*** Careful delineation of classical symptoms of Koro is crucial to differentiate it from Koro-like symptoms (KLS) (Garlipp, 2008; Chowdhury, 2008a) or states (Mukherjee, 1987). Since Koro involves sexual organ in its clinical presentation, during an epidemic wave, many individuals with varied psychopathosexality (and accompanied emotionality ranging from depression-anxiety-hypochondriasis to body dysmorphic perception, etc.) may present as if they are suffering from Koro. 'Koro-like symptoms' is an accepted diagnostic category since Berrios and Morley (1984) first described it in 1984. In KLS, symptoms are less dramatic and usually do not have strong cultural context, and are usually seen in association with other neuropsychiatric disorders (Freudenmann & Schonfeldt-Lecuona, 2005a). Association of KLS with varieties of psychiatric and non-psychiatric disorders has been reported, e.g., with recurrent depressive disorder (Freudenmann & Schonfeldt-Lecuona, 2005b); mood-disorder (Damodaran & Nizamie, 1993); generalized anxiety

disorder and panic (Al-Hmoud, 1999); schizophrenia (Maslowski, 1988; Ntouros *et al*, 2010); intellectual disability with fixated pedophilia (Faccini, 2009); voyeurism (Witztum *et al*, 1998); HIV infection (Heyman & Fahy, 1992); genital pain (Caballero *et al*, 2000) and prostatic enlargement (Naim, 2010). Clinicians should be cautious about this differential diagnosis because from the point of descriptive psychopathology correct cultural formulation is essential to understand the CBS in the background of its cultural context (Chowdhury, 1998; Yang *et al*, 2009).

The other point of clinical interest is the difference between delusional belief of penile retraction in Koro (Ungvari & Mullen, 1994) and perception of small penis (Chowdhury, 1993). Common clinical mistakes are to merge both. Delusion of retracting (and thus small) penis may be either manifestation of Body Dysmporphic Disorder (Phillips, 2004) or penile dysmorphophobia, as in Koro (Chowdhury, 1989c,d) and a 'Small penis Syndrome' (Murtagh, 1989; Wylie & Eardley, 2007) is often present with varieties of urogenital pathology (Shamloul, 1995), hypochondriasis and even in otherwise normal person (Lee & Reiter, 2002). These are static penile perception over a long period of time but in Koro the penile retraction and consequent shortening is a sudden, acute dynamic perception with manifest acute anxiety and the course of illness is short. Prominence of cultural context is absent in the former while present strongly in the latter.

***Koro-perception*** One of the several attempts to classify CBS is 'taxon categories' (set of similar syndromes which share common or related symptoms) (Simons & Hughes, 1985). Koro was placed under the 'genital retraction taxon' where retraction is the pivotal criteria. It was thus proposed to replace the term Koro with Genital Retraction Syndrome (Edwards, 1984). A 'Koro-like' symptom affecting the tongue was reported from Malyasia (Chin & S'ng, 1995) with the suggestion that retraction taxon can involve other organs (and may not be always culture-bound). Complementary to this concept we propose the term 'Koro perception' where retraction from inner pull from within the body (of any organ) is the prime clinical presentation. One case in this study in addition to penile symptoms complained of 'Koro perception' - shrinking feeling of arms, legs and ears. This is a new finding.

***Treatment*** Koro as culture-bound phenomenon is always linked with high emotional burden (Chowdhury, 1992c) so far as the cultural construct of male sexuality including physical and functional potential of penis and male sexual identity (Chowdhury, 1991a), is concerned. Hence Koro presentation commonly occurs with a mixture of high anxiety and depression (Chowdhury & Rajbhandari, 1995), especially in epidemic setting. So immediate treatment calls for a symptomatic approach, usually with anxiolytic and antidepressant medication. Treatment with a combination of benzodiazepine and SSRI yields rapid recovery (Hallak *et al*, 2000; Nakaya, 2002). Strong reassurances with supportive psychotherapy and in some cases long-term insight-oriented psychotherapy is always helpful (Fishbain *et al*, 1989).

***Body Heat Explanatory Model*** 42.3% cases of this epidemic implicated 'body heat' generated from the 'body weaknesses' as the cause of their penile retraction. Excessive 'body heat' was predominantly implicated by the patients (54.5%) as the cause of penile shrinkage in 1982 Koro epidemic also (Chowdhury, 2008b). In this epidemic, almost all the victims complained of a feeling of body heat prior to Koro attack. Body cooling, the prevailing folk therapy was thus advocated by Priests, Gunins and Maulavies and was well accepted by all including the non-affected family members of the victims and general public. In fact because of this excessive water submersion for hours together many Koro patients became seriously ill with respiratory distress. Similar ill effects and health hazards of folk therapy were also noted in the previous Koro epidemic in West Bengal (Chowdhury, 1991b). The heat-cold concept in Koro is a common social cognition and is also reported from Mumbai and Assam cases as well.

***Folk rituals*** Folk therapeutics is an important component of any CBS. In addition to water cooling by water-submersion or ice-bath, one other ritual utilised the advanced technology of copier machine. Both Koro and non-Koro subjects, in massive numbers, procured a copy of chanted paper and a page containing lines from the holy Koran. This is a new finding of social response to prevent the Koro-

infectivity. Interestingly, in 1984-85 Koro epidemic in Guangdong, China, folk therapy constituted of feeding red pepper jam, black pepper or ginger juice (Tseng *et al*, 1988).

***Epidemicity and social cognition*** Panic and anxiety in neighbourhood is a strong risk factor for any psychiatric epidemic (Chowdhury, 1992d; Cheng, 1997). Community's perception of infectivity of Koro is a dynamic force (Chowdhury, 1992e; Tseng *et al*, 1992) that speeds the epidemic which was observed here in mass-panic reaction and adopting of folk preventive measures in massive numbers. Many avoided going out or were absent from work. Previous social experience with viral epidemic (Bird flu) added further uncertainty and anxiety in the population. The price of bottle-gourd reached to an astonishing level in the local markets (from usual cost of Rs. 4-6 to Rs. 40-45) and people from all categories of life put the lime spots on the ear lobule and forehead. This ritual was also observed in Assam and during previous epidemic in West Bengal (Chowdhury *et al*, 1988). This mass reactivity highlighted the community anxiety relating to Koro which has further fuelled its spread in the neighbourhood.

***Role of local health agencies*** Timely intervention by health advocacy is an important measure to check the spread of any epidemic, be it medical or psychic and in this regard the role of medical community is crucial (Chowdhury, 1991c). Unfortunately, the extreme dilemma and poor response from local health administration is well noted in the present epidemic (Bartaman, 2010b). This might be one of the reasons which have not only prolonged the epidemic wave but pushed people to adhere to folk explanation and therapy.

***Role of media*** Media is a very sensitive and powerful pathway by which epidemic news percolates through the society (Small & Borus, 1987). *Assam Tribune* made a cautious statement on this issue and in West Bengal too, during the first week of the epidemic, almost all the news daily of Kolkata, Television channels covered this epidemic with very ambiguous and sensational headlines for at least 4-5 consecutive days. This helped spread the news of this "strange and mysterious disease" in a wider public circle rapidly. The epidemic waves stayed for about eight weeks.

## CONCLUSION

There are at least five Koro epidemics that occurred in India and the State of West Bengal and Assam were affected repeatedly. Therefore population of these states has Koro vulnerability of epidemic proportion. The health administration and professionals should learn from these Koro episodes and equip themselves with adequate knowledge and preventive strategies, so that in future they can act proactively not only to restrict the epidemic spread of Koro but also to provide appropriate treatment to the affected population at the hour of need. This would also prevent chronicity of the problem (Chowdhury & Brahma, 2004; Kar, 2005b). Mental health professionals should transmit the knowledge of Koro illness and pathology to other non-psychiatric colleagues to enhance their clinical precision in diagnosis (Chowdhury, 1990b) and treatment (Chowdhury, 1995). Mental health professionals should play a leading role in the education of the local health agencies in management principles and also support media and others to enhance their limited knowledge about the subject of Koro. Further, various faculties of the media should be more amenable to health advocacy and aid in education of the public in order to mitigate mass fear and anxiety and enhance the spread of rational information.

## NOTES

1. One of the author (ANC) made a field trip to north east India recently and found that this Koro epidemic also touched the state of Tripura in December 2010 and there was a massive Koro epidemic in the state in 1998 also (Nath *et al*, 2011). He also met Dr H.R.Phookan (2011), a researcher of 1982 Koro epidemic from Assam and he told that there were quite a few good number of Muslim Koro patients seen in Assam. He traced a link with a pocket in Bangladesh where people have frequently suffered Koro attack and they linked it with persons who visited Bangladesh from neighbouring Myanmar. In Assam it is popularly called 'Mian Syndrome' (Mian is an Urdu syntax used to address a male person as 'Mr.' in Muslim culture). In the world

Koro literature there is a paucity of Koro reported from Muslim culture except a few (Osman & Mahmood, 1992; Al-Hmoud, 1999; Atalay, 2007; Saman *et al*, 2007).

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