UNANI APPROACH IN MYSTERIOUS AND UNFOLDING *CHAMKI BUKHAR* (ACUTE ENCEPHALITIS SYNDROME) - AN ANALYTICAL PROPOSAL

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ABSTRACT

Background: Acute Encephalitis Syndrome (AES), locally known as Chamki Bukhar / Litchi fever in Bihar, is a major public health problem in India and various pathogens are claimed responsible for this. Seasonal outbreaks of AES occur regularly in India and lead to substantial mortality. Although Japanese encephalitis virus (JEV) is a key etiological agent for AES in India, and has attracted countrywide attention, many recent studies suggest that enteroviruses and rhabdoviruses might account for outbreaks of AES.

Need of the study: There is no concrete solution yet despite national and international health Agencies & research institutes are struggling to propose the solution. Since various etiological theories have been put forth but nothing decisively came up. So, to address and investigate this grave health issue through Unani System of Medicine (USM) which offers a rational approach in even emerging and new diseases we have conceptualize this study and hypothesize that, this study will pave a new approach, suggestion & solution which surely will aid in current understanding and management of Chamki Bukhar and may be a milestone for further research development in this regard.

Objectives: To gather and compile Unani literature to address the complaints resembling Chamki Bukhar and to provide possible Unani approach in Chamki Bukhar - prevention, control & management.

Methods: A cross-sectional study was conducted using pre-designed, semi-structured questionnaire to obtain data of 200 clinically diagnosed patients of AES. Primary data of 91 patients from PMCH, AES Ward (Paediatrics) and secondary data of 109 patients from clinical records and reports provided by the NVBDCP department were obtained. The clinical presentations of the case of Chamki Bukhar were re-confirmed and subjected to comparison with the diseases resembling in Unani literature, so that possible proposal of management and prevention may be advised. The mizaj of the patients were assessed through Ajnase Ashra proforma so that a possible temperamental correlation may be made.

Results & Observations: The results show that Chamki Bukhar/AES is very similar to Sarsam and warme Dimagh- All the characteristics are strikingly similar. Even Limbic encephalitis, a subtype of AES, shares symptoms with Lesarghus, a subtype of Sarsam. Therefore, control measures and management protocols for Chamki Bukhar can easily be employed in the management of Chamki Bukhar based on existing knowledge.

Keywords: *Unani Medicine; AES; JE; Chamki Bukhar; Sarsam; Warme dimagh; Lesarghus:Litchi fever; Navka Bukhar.*

INTRODUCTION

Acute encephalitis syndrome (AES) is a major health issue in regions of the Gangetic area of Bihar. The main age group affected is 5-15 years. The syndrome is locally known as Chamki Bukhar/Litchi fever in Bihar[1].

Chamki Bukhar (CB) is an unexplained acute neurological illness affecting children with a high case fatality rate (CFR). It was firstly reported in Muzaffarpur and their adjacent districts in 1995. The disease affects the central nervous system and can cause severe complications, seizures and even death. The CFR of this disease is very high and those who survive may suffer from various degrees of neurological sequelae. An estimated 25% of the affected children die; and among those who survive about 30%-40% suffer from physical and mental impairment[1].

Chamki Bukhar clinically present with the onset of acute febrile illness and alteration in mental status (e.g., confusion, disorientation, unable to talk and coma) with or without the new onset of seizures. The case fatality ratio was 355 in 2014 in Bihar. The case of CB in the regions of the Gangetic area is reported every year since 1995 mainly in the month of April to October. Chamki Bukhar is one of leading cause of neurological disease and is of public health concern. AES was first described in Japan in 1871 and subsequently characterized for the first time in the year 1943. The history of AES in India over decades has been considered to be parallel to that of Japanese Encephalitis[2].

Acute encephalitis is identified in children who suddenly develop symptoms and signs of brain inflammation. Symptoms such as altered consciousness, seizures, and abnormal muscle tone associated with upper motor neuron dysfunction suggest cerebral impairment. Acute encephalopathy and acute meningitis—whether caused by bacteria, tuberculosis, fungi, or viruses—are additional types of acute central nervous system conditions that need to be differentiated from acute

encephalitis. Acute encephalopathy is characterized by non-inflammatory brain pathology, often related to biochemical disturbances, which typically results in cerebrospinal fluid (CSF) that does not exhibit pleocytosis symptoms often appear suddenly, typically in the morning, without a preceding prodromal phase, particularly if the child was well the night before. Indicators of cerebral dysfunction include changes in consciousness, seizures, muscle tone abnormalities associated with upper motor neuron lesions, and abnormal movements. Additionally, episodes of encephalopathy occurring in clusters are sometimes confused with outbreaks of acute encephalitis[3,4].

In the classical text of Unani, the terminology "Acute Encephalitis Syndrome" is not explained as such; but the concept of *Chamki Bukhar* is vibrantly available. Signs and symptoms of *Sarsam* and *Warme Dimagh* were discussed in USM which are closely related to Acute AES/CB. This study has been set to collect, explain, correlate and to develop the Unani approach in *Chamki Bukhar*[5].

After ethical clearance, data from 200 patients diagnosed with AES were collected using a pre designed semi-structured questionnaire. A total of 91 patient's primary data from the AES ward (Paediatrics) at Patna Medical College and Hospital (PMCH), together with secondary data from clinical records and reports provided by the National Vector Borne Disease Control Program (NVBDCP) department in Patna, were collected. From these data we gather comprehensive information on AES/CB, including signs and symptoms, causal factors or etiology, affected age groups, involved *mizaj* and awareness of the condition. Later the same has been subjected to correlation with the possible similar diseases mentioned in USM. Classical Unani literatures and research papers were searched and analyzed to compile descriptions of diseases having similar presentation.

AIMS AND OBJECTIVES
- To compile and compare Unani literature addressing *Chamki Bukhar*.
- To provide possible Unani approach in *Chamki Bukhar* - prevention, control & management.

METHODOLOGY
This was an observational study. Before embarking upon the project, a comprehensive protocol was chalked out and put forth for ethical clearance from the Institutional Ethics Committee of Govt. Tibbi College and Hospital (GTCH), Patna (IEC No-GTCH/IEC-019/TST/2020-21/03). After ethical clearance, study was started by collecting data and searching literature. This study stretched from June 2021 to December 2023.

Place of study:
- AES pediatric ward, PMCH for observation of AES infected patients.
- NVBDCP office, Mahendru, Patna to collect the list of past cases of AES

Study design: Cross Sectional study
Sample size: Sample size was kept 200.
Duration of study: 12-18 months

Inclusion criteria:
- Clinically diagnosed patients of AES
- Patients of either sex
- Any age group

Exclusion criteria:
- Undiagnosed cases
- Cases with history of CNS disorder

Method of data collection: After getting ethical clearance, clinically diagnosed cases of AES, qualifying inclusion criteria were included in the study. The verbal and written consent were taken before conducting the procedures from 91 patient from PMCH. A pre-designed semi-structured questionnaire was used to obtain data after explaining the purpose of the study. A relevant primary data on socio-demographic profile, clinical profile was collected by interviewing the parents/ accompanying person of the patient admitted in AES ward of PMCH. Rest of the data was collected retrospectively from the clinical records and reports provided by NVBDCP department; Patna and further details/queries were obtained/ confirmed through telephonic conversation generally with patient party in this case.

Tools of data Collection: A pre-designed semi-structured questionnaire, the assessment of outcome was based on the questionnaire proforma which includes the following points.
- Personal details – Name, Age, Sex, Source of income, Occupation, Educational qualification
- Underlying condition – Diabetes, Hypertension, Malignancy, Cardiac disease, Malnutrition
- Asbabe sitta zarooriya status– Ventilation, Food & drinks, Body movement and repose, Mental movement & repose, Sleep & wakefulness, Retention & evacuation.
- Symptom of disease -Fever, Headache, Vomiting, Delirium, Convulsion, Comma, Body ache, Breathing difficulty.

- ▪ Severity of the disease – Mild/ Moderate/ Severe.
- ▪ Hospital stay condition – ICU/ Intubation/ Oxygen support.
- ▪ Duration of Hospital stay – Date of admission & Date of discharge.
- ▪ Laboratory finding – PCR, CSF analysis, Blood sugar, serum electrolyte analysis.
- ▪ Addictions – Smoking/ alcohol/ Tobacco etc.
- ▪ Vaccination status – JE
- ▪ Treatment status
- ▪ Assessment of *Mizaj- Damvi/ Balghami/ Safravi/ Saudavi*

Outcome assessment: The main aim of this study was:
▪ To record the clinical feature (sign & symptoms) of AES/CB case.
▪ To know about the causative factor or etiology.
▪ To know the age group affected.
▪ To check the awareness about the disease.
▪ To know about the mizaj involved (91 patients from PMCH).
▪ To collect all the details of AES/CB so that the same can be compared with understanding of AES like disease mentioned in Unani medicine's literature.

Study Method: In this study, total 200 subjects were included. 91 patients from PMCH, AES ward (Paediatrics) & 109 patients' clinical records and reports collected from NVBDCP department; Patna, further queries were resolved by telephonic conversation from the patient list produced by NVBDCP, Patna. Disease having similar clinical manifestation and description to AES/CB from classical unani literature were searched and compared. *Sarsam* and their types found to be almost similar with AES/CB. Treatment, Management and preventive strategies advocated for *Sarsam* were advocated for the AES/CB.

Statistical analysis: Percentage, Mean and Median was used to analyze the data statistically. **Documentation:** The consent form and filled CRF/questionnaire were submitted to the Department of Tahaffuzi wa Samaji Tib, GTCH, Patna.
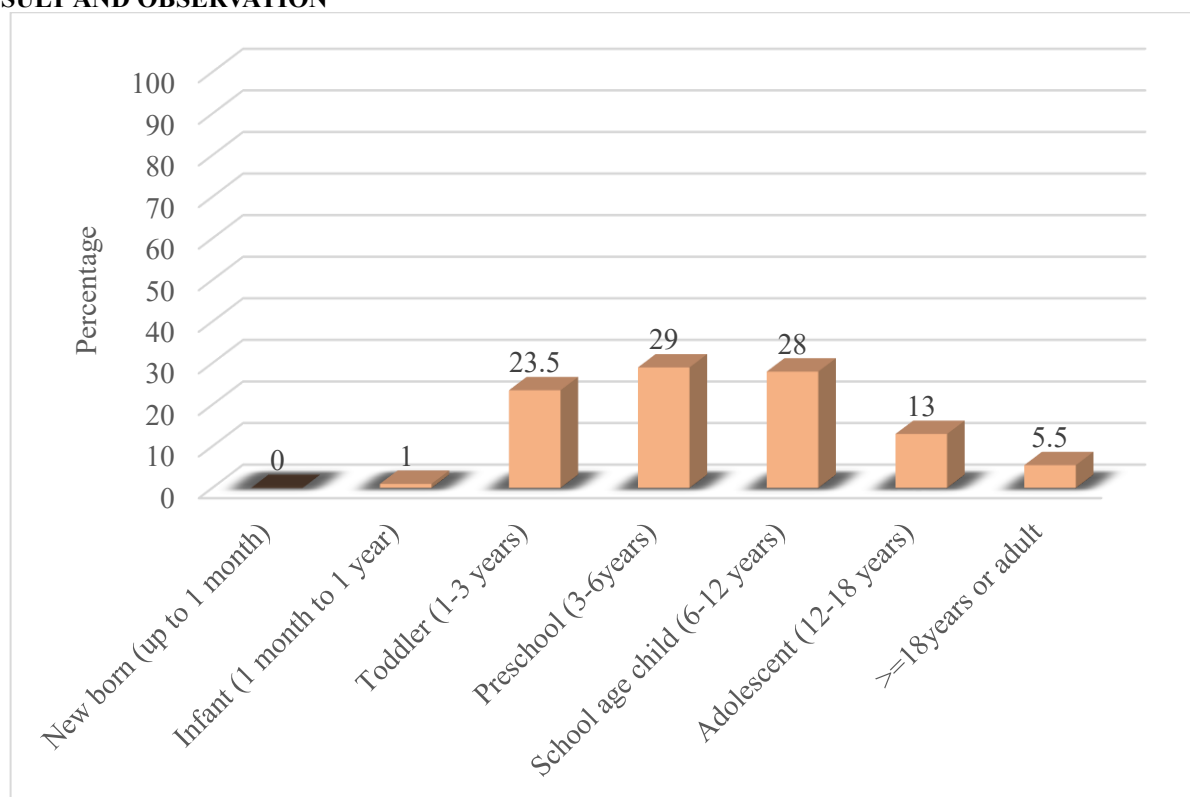
RESULT AND OBSERVATION

Figure 1. Shows the age group wise distribution of study participants (N=200)
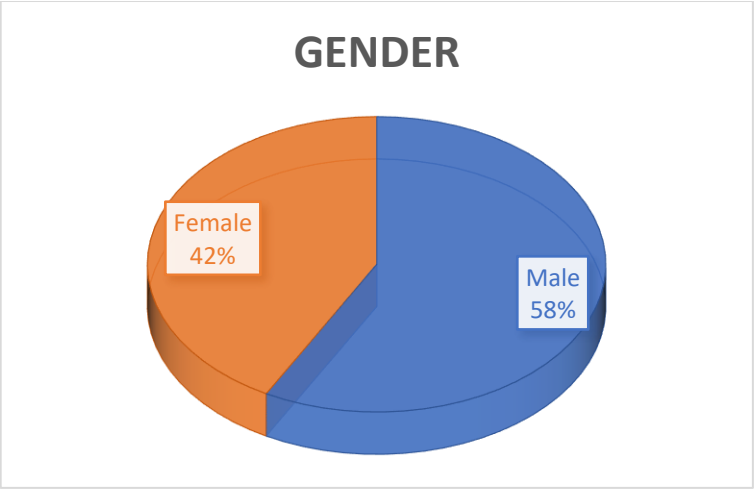
Figure 2. Shows gender wise distribution of participants.
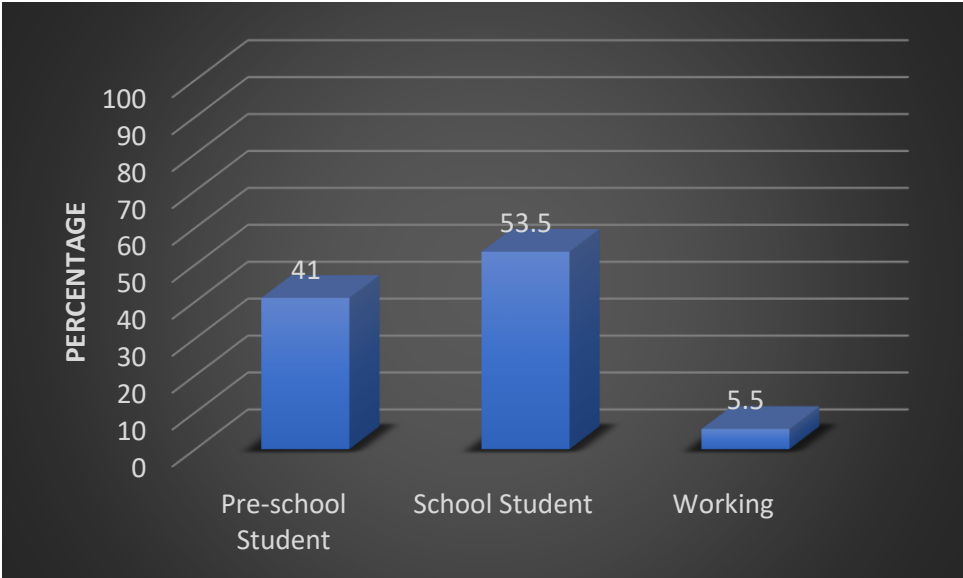

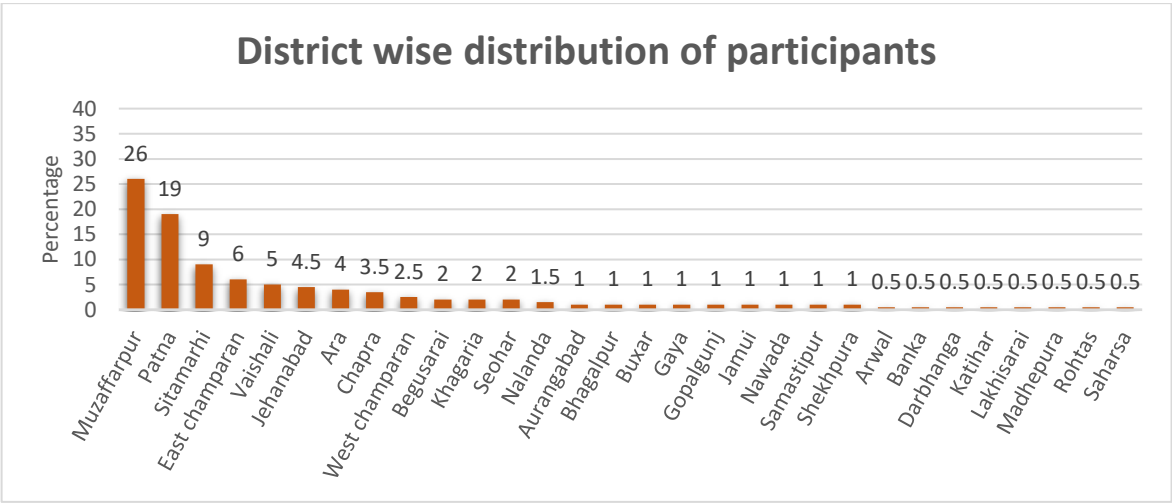Figure 3. Shows distribution of participants according to occupation

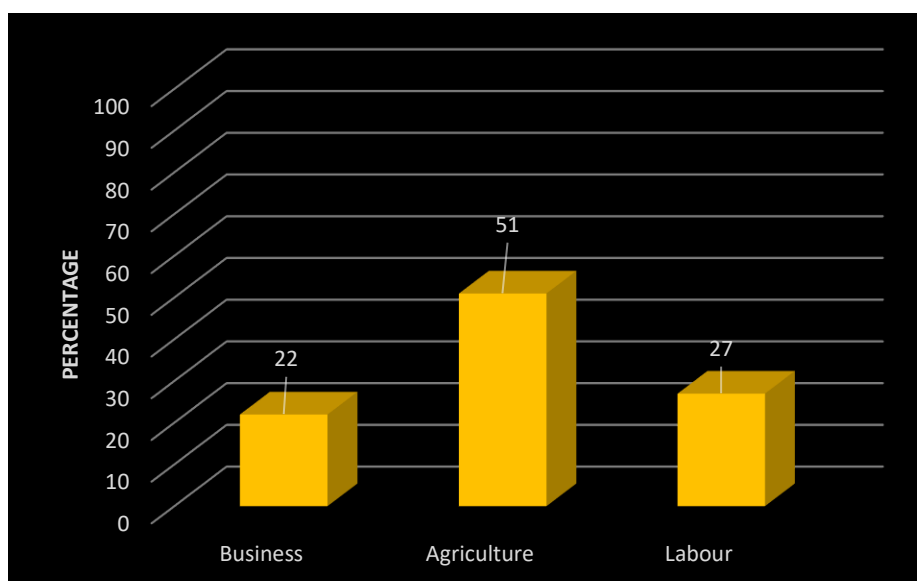Figure 4. shows district wise distribution of participants

Figure 5. Shows the source of income of family

Table No.1: Distribution of participants according to high-risk exposure (N=200)		
Particular	Frequency(n)	Percentage (%)
Pig		
Yes	50	25
No	150	75
Paddy		
Yes	196	98
No	4	2
Poultry		
Yes	195	97.5
No	5	2.5
Litchi		
Yes	128	64
No	22	11

Table No.2: Distribution of participants according to missed dinner (N=200)		
Missed dinner	Frequency(n)	Percentage (%)
Yes	5	2.5
No	195	97.5

Table No.3: Distribution of participants according to malnutrition (N=200)		
Malnutrition	Frequency(n)	Percentage (%)
Yes	174	87
No	26	13

Table No.4: Presentation of participants according to symptoms (N=200)		
Fever		
Options	**Frequency(n)**	**Percentage (%)**
Yes	200	100
No	0	0
Cough		
Yes	39	19.5
No	161	80.5
Breathing difficulty		
Yes	82	41
No	118	59
Body ache		
Yes	57	28.5
No	143	71.5
Vomiting		
Yes	136	68
No	64	32
Chills		
Yes	73	36.5
No	127	63.5
Shivering		
Yes	136	68
No	64	32
Headache		
Yes	136	68
No	64	32
Delirium		
Yes	179	89.5
No	21	10.5
Convulsion		
Yes	184	92
No	16	8
Comma		
Yes	186	93
No	14	7

Table No.5: Distribution of participants according to outcome of illness (N=200)		
Outcome	**Frequency(n)**	**Percentage (%)**
Death	17	8.5
Recovered	183	91.5

Table No.6: Distribution of participants according to duration of hospitalization (N=188)		
Particulars	**Mean±SD**	**Median (IQR)**
Hospitalization (in days)	8.2 ± 5.7	7 (3, 12)
Duration of stay in hospitals	**Frequency (n)**	**Percentage (%)**
1 week	96	51.1
2 weeks	62	33.0
>2 weeks	30	16.0

Table No.7: Distribution of participants according to severity of symptoms (N=200)		
Severity of symptoms	Frequency (n)	Percentage (%)
Mild	40	20
Moderate	74	37
Severe	86	43

Table No.8: Distribution of participants according to ICU admission (N=100)		
ICU admission	Frequency (n)	Percentage (%)
Yes	181	90.5
No	19	9.5

Table No.9: Distribution of participants according to intubation during hospitalisation (N=200)		
Intubation	Frequency (n)	Percentage (%)
Yes	52	26.0
No	147	73.5

Table No.10: Distribution of participants according to oxygen support during hospitalisation (N=200)		
Oxygen support	Frequency (n)	Percentage (%)
Yes	165	82.5
No	35	17.5

Table No.11: Distribution of participants according to radiological investigation (N=200)		
X-Ray/CT scan done	Frequency (n)	Percentage (%)
Yes	119	59.5
No	81	40.5

Table No.12: Distribution of participants according to JE vaccination(N=200)		
Vaccine received	Frequency (n)	Percentage (%)
Immunized	152	76
Partial	68	34
Unimmunized	48	24

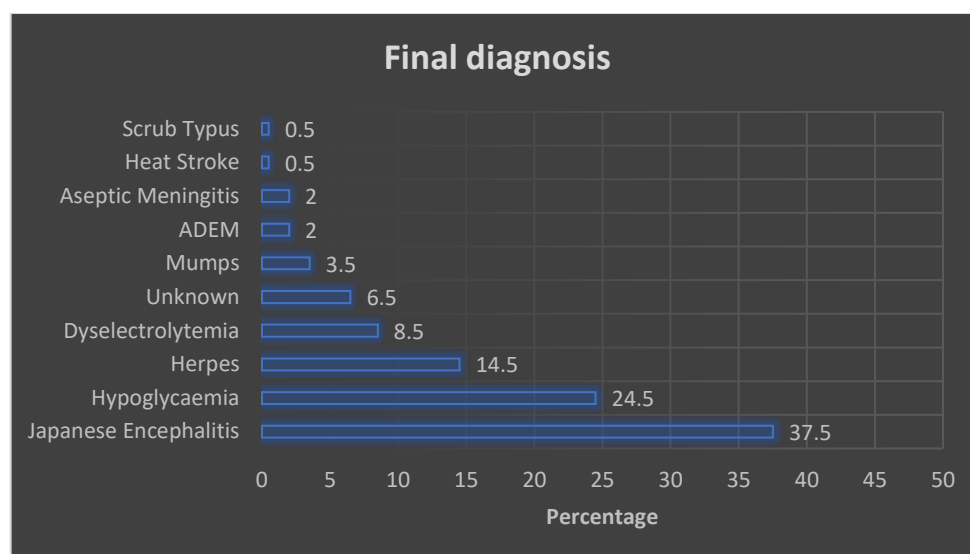| Table No.13: Distribution of participants according to final diagnosis (N=200)		
Particular	Frequency (n)	Percentage (%)
ADEM (Acute disseminated encephalomyelitis)	4	2
Aseptic Meningitis	4	2
Dyselectrolytemia	17	8.5
Heat Stroke	1	0.5
Herpes simplex	29	14.5
Hypoglycemia	49	24.5
Japanese Encephalitis	75	37.5
Mumps	7	3.5
Scrub Typus	1	0.5
Unknown	13	6.5

Figure 6. Distribution of participants according to final diagnosis (N=200)

Table No.14: Collection of Data from various institutes (N=200)		
Institution	**Frequency(n)**	**Percentage (%)**
PMCH, Patna	91	45.5
SKMCH, Muzaffarpur	89	44.5
IGIMS, Patna	02	01
AIIMS, Patna	18	09

Table. No.15: Clinical Manifestations: Chamki Bukhar Versus *Sarsam*[6-21].					
Signs and symptoms	*Chamki Bukhar*	*Sarsam*			
		Faranitus	*Faranitus Khalis*	*Sarsame Saudavi*	*Lesarghus*
Fever	+	+	+	+	+
Delirium	+	+	+	+	+
Coma	+	+	+	+	+
Nabz	Murta'ish (Kapkapi)	Azeem	Saree	Sulb Aur Mukhtalif	Layyin
Headache	+	+	+	+	+
Coma	+	+	+	+	+
Seizure	+	+	+	+	+
Neck & Back Stiffness	+	+	+	+	+
Vomiting	+	+	+	+	+

Table No.16: Comparison of *Subaat* and Coma			
S. No.	**Signs and Symptoms**	***Subaat***	**Coma**
1	Inability to voluntarily open the eyes	+	+
2	A non-existent sleep-wake cycle	+	+
3	Lack of response to physical (painful) or verbal stimuli	+	+
4	Depressed brainstem reflexes, such as pupils not responding to light	+	+
5	Abnormal, difficulty or irregular breathing or no breathing	+	+

Table No.17: Comparison of *Jumood* and unconsciousness (catalepsy)			
S. No.	Sign and Symptoms	*Jumood*	(catalepsy) unconsciousness
1	Sudden and transient episode of muscle Weakness	+	+
2	Disoriented	+	+
3	Verbal response	+	+
4	Motor response	+	+
5	Awake and alert	+	+

Table No.18	
Management of *Faranitus*[14-15].	
Venesection	First three days, venesection of *Rage Qaifaal* (Cephalic vein)
Talyeene amaa (Laxative)	For relieving constipation *Sharbat Aaloo Bukhara* with *imli* & *Turanjabeen* may be used.
Huqna (Enema)	If constipation not relieved by laxative, then apply enema of *amaltaas*
Lakhlakha (Aromatic inhalation)	*aabe kishneez*, *roghane gul*, *sandal safed* (3gm) & *Gile armani* (2gm), *khas* (3 gm) etc.
Diet	Only *Maul Shaeer* may be used
Tabreede Raas (cold sponging)	For the purpose to induce coldness to brain, firstly hair should be removed followed by application of *Gulab* (2gm) + *Sirka* (20ml) -wet the cloth with this solution and place over anterior fontanelle (*chundia*)
Mashroob (Liquid diet)	*Luabe behi dana (2gm) + Sheera Unnab (4gm) + Sheera Tukhme Kaahu (3gm) + Sheera Maghze Kaddu (3gm) + Arqe Bed Mushk (20 ml) + Arqe Gulab (20ml) + Sharbat Nilofar (20ml) - m*ix and drink.
Mushil (Purgative)	*Imli (2gm) + Turanjabeen (20ml) + Sharbae Warde Muqarr (20ml) + Arqe gaozubaan (20ml)*
After Cure	*Muqawwie Dimagh* medicine given; *Khameera Gauzabaan Ambari (5gm), Khameera Abresham Sheera Unnab Wala (5gm).*

Table No.19	
Management of *Faranitus Khalish*[14-15].	
Maul fawakeh (fruit juice)	This disease is due to *Gair tabi safra,* for this purpose these drugs may be used as a *Qate safra* eg, *Imli, Unnab, Aaloo bukhara, Turanjabeen, Sheer Khasht, Maul Shaeer, Aabe anaar, Aabe Aaloo bukhara, Aabe Khayar, Aabe kaddu.*
Nutool / Shirodhara (Irrigation)	in case of insomnia- *Banafshan + Nilofer + Peel of Kaddu + Khatmi, Kahoo + Poste khashkhash + gul baboona* may be used.
Pashoya (Foot Bath)	*Gule Banafsha + Gule Khatmi + Namake Taam + Berge Sana*e *Makki* - mixed with 3 liters of water and boiled it, till third of decoction remain - used for washing feet.
Huqna	*Gule benafsha (1gm) + Unnab (15 piece) + Sapista (15 piece) + Gule Surkh (1gm) + 1.5* litter of water boiled and filtered, add *namake taam* (6gm) + *Roghane baid injeer (20ml)* and use.
Lakhlakha	Single drug like *Sandal, Mushk* and *Zaafran* etc used
Tabreede Raas (cold sponging)	For the purpose to induce coldness to brain, firstly hair should be removed followed by application of *Gulab* (2gm) + *Sirka* (20ml) -wet the cloth with this solution and place over anterior fontanelle.
In thrirst	Only *Arqe nilofar* is given.
Diet	*Maus Shaeer, Aabe moong, Aabe yakhni (gosht), Anar ka pani*
Mushil (Purgative)	For the purpose drugs advised are - *Imli* (4gm) + *Turanjabeen* (20ml) + *Sharbate dinar* (10ml) + *Sharbate warde moqarraz* (4gm) + *Arqe gauzaban* (20ml)
Resting room	Dark room with low temperature, Cold room, aerated with proper ventilation, High pillow recommended.

Table No.20	
Management of *Lesarghus*[14-15].	
Diet	*Mung ka pani, mung ki khichree*
Huqna	Preparation having *Bekhe krafs* + *Bekhe kibr* + *Bekhe badyaan* + *pudina* + *Bekhe izkhar* is advised for this purpose.
Munzije Balgham	*Gule banafsha* (7gm) + *Maveez munaqqa* (9pcs) + *Bekhe kasni* (7gm) + *Gauzaban* (5gm*)* + *Tukhme khatmi* (5gm) - *Neem kub* + *hot water* - with *Khamira banafsha* for *7-10* days.
Mushile balgham	*Bbarg e sana 7 mg + maghz e khayar shambar 4 gm + Tamare hindi 4 gm+ zanjabeel 5gm+ sheer khahst 20 ml+ sheera e maghz e badam sirin 5pices- 3-4 day*
Habbe ayarij	One dose (3 gram with arqe gauzaban)
Takmeed wa Taskheen	For this purpose, fomentation on scalp (after removal of hairs) and application of *Moong bread* (one side baked). local application of fresh chicken or pigeon (as a whole after removing of intestine) on scalp.
Muqawwiyat	*Kushta Khubsul Hadeed* (200mg) + *Kushta Marjan Jawahar wala* (200mg) + *Dawaul Misk Motadil* (2gm).

Table No.21	
Management of *Saudavi Sarsam*[14-15].	
Munzij	*Joshanda halela* + *Gauzaban* + *Bisfayej* + *Barge badranjaboya* + *Turanjabeen*
Mushil	*Halela* + *Halela kabuli* + *Aftimoon* + *Sana* + *Badranjboya*+ *Gauzaban* + *Bisfayij* + *Maweez munaqqa* + *Roghane badam*
Huqna	*Badranjboya*
Nutool	*Gule surkh* + *Nakhuna* + *Barge khar khasak*
Taskheen	Massage with luke warm oils like – *Roghane nilofar, Roghane banafsha*
Zimad	*Maghze tukhme kaddu* + *Maghze tukhme tarbooz*
Diet	*Maus shaeer* is recommended.

DISCUSSION

The present study entitled "Unani Approach in Mysterious and Unfolding *Chamki Bukhar* (Acute Encephalitis Syndrome)- An Analytical Proposal" has been undertaken to establish an understanding of *Chamki Bukhar* in Unani Medicine and propose a concrete possible management.

Out of two Hundred patients included in the present study with mean (± SD) age was observed as $8 ± 9.6$ years, in which majority of patients belonged to preschool age group (3-6 years) i.e., 58(29%) patients, followed by school age child (6-12 years) i.e., 56(28%) patients, followed by toddler (1-3 years) 47 (23.5%). 26 (13%) patients belonged to adolescent age group (12-18 years), 11 (6%) patients belonged to adult i.e. 18 years or older. 02 (1%) patients belonged to infant (1 month to 1 year) and no patient were new born (up to 1 month) (Fig.1). Predominant age group affected with AES was 3-12 years, similar findings were reported by Saumyen *et al* (2015) which is contrary to Kakkar *et al* (2013) and Kamble *et al* (2016), where Chamki Bukhar (CB) predominantly impacted the age group of 1-12 years which means locomotory children are more prone to CB[22,23,24].

In the present study 116 (58%) patients were male and 84 (42%) patients were female. Majority was male. (Fig.2) The findings resemble the earlier studies done by Kamble *et al* (2016) and Manish *et al* (2013). It might be because male child has comparatively more freedom of outing[24,25].

In our study, most patients 107 (53.5.0%) were School going children, 82 (41%) were preschool children and 11 (5.5%) patients were workers (Fig.3). This suggest that gathering and mingling of children favours the transmission of CB because school going and pre-school children are highly locomotive and usually mingle with others.

In our study, most cases were found in Muzaffarpur i.e.52 (26%) and lowest in Arwal, Banka, Darbhanga, Katihar, Lakhisarai, Madhepura, Rohtas and Saharsa i.e. 1 (0.5%). (Fig.4). Similar report of major occurrence in Muzaffarpur district was reported by https://www.civilsdaily.com/burning-issue-acute encephalitis-syndrome-aes/. This suggests that the local factors/conditions of the particular districts might be a factor behind this along with confirming the etiological association with litchi consumption, which must be evaluated precisely in future ahead[1].

Most of the patients 44 (22%) were from business class, 102 (51%) were from Farmer labour and 54 (27%) patients from labour class (Fig.5). This suggest that CB has strong affinity with village and agriculture along with socioeconomic conditions which favors the incidence in many ways. i.e. malnutrition, litchi consumption, agriculture linkup, unhygienic

condition and overcrowding etc. This finding is similar to previous study by Kamble *et al* (2016) who found majority (86.8%) were farmer[24].

In our study, high risk exposure was reported as association with Pig 110 (55%), 196 (98%) were exposed with Paddy, 195 (97.5%) exposed with Poultry and 178 (89%) exposed with Litchi (Table No.1). Association with litchi is quite strong, same has been supported by https://www.civilsdaily.com/burning-issue-acute encephalitis-syndrome-AES/. Pig, Paddy, Poultry and litchi association strongly suggest the rural orientation of CB. High risk exposure with Pig was supported by Bhaswati *et al* (2013) i.e., 48.11%, which is similar to our finding. This consideration must be kept in mind while handling the case[1,26].

In our study, patients with missed dinner history were 25 (12.5%) and 175 (87.5%) are those patients who do not missed their dinner (Table No.2). Usually in Muzaffarpur area it was reported that the children who missed their dinner were affected easily due to unripe litchi, so more cases like this were reported from there. Similar report of major occurrence in people who missed their dinner was reported by www.civilsdaily.com/Burning-issue/aes. This association can be justified by further more precise research on comparatively bigger sample size[1].

We found, malnourished patients on high risk with 174 (87%) whereas non malnourished patient was only 26 (13%) (Table No.3). The parameter to measure the malnutrition as decided by investigator was physical appearance of the patient. This shows that malnourished are more prone to infections due to weak immunity. This finding is supported by prior study by Kamble *et al* (2016). We suggest malnutrition must be of concern while proposing preventive strategies at risk group population[24].

In our study, patients with Fever were 200 (100%), Cough -39 (19.5%), breathing difficulty- 82 (41%), Body ache 57 (28.5%), vomiting- 136 (68%), chills 73 (36.5%), Shivering 136 (68%), Headache 136 (68%), delirium 179 (89.5%), Convulsion 184 (92%) and comma- 186 (93%) patient. (Table No.4) The similar sign & symptoms were found in the study of Rathore *et al* (2014). These clinical features are almost matched with c/f of *Sarsam* and *warme dimagh* mentioned in Unani Medicine. This finding and their similarities with *sarsam* and warme dimagh suggest that preventive measures, management and treatment adopted for *Sarsam* and *warme dimagh* should must be adopted in case of *Chamki Bukhar*. Only then the actual applicability of Unani regimens can be tested. We suggest marathon observational as well as comparative RCT to validate and have evidence in this regard [5-21,27].

In our study, 17 (8.5%) cases lead to death and 183 (91.5%) were recovered. (Table No. 5), similar outcome recorded by Rathore *et al* (2014) and contrary findings were reported by Khinchi *et al* (2010). This suggest the higher disease fatality rate, that must be countered by any means – inviting Unani medicine approach in particular and traditional medicine in general because of limitation of conventional treatment methods [27,28].

We found, stay in hospitals of 1 week were in 96 (51.1%) cases, whereas 2 weeks were in 62 (33.0%) and >2 weeks were in 30 (16.0%) cases. Majority of cases were non-viral in origin those were discharged within a week. (Table No.6) Duration of hospitalization for maximum patients were 1 week or 7 days, similar finding reported by Soumeyn *et al* (2015)[22].

In our study, mild cases were 40 (20%), 74 (37%) were moderate and maximum patients i.e., 86 (43%) were severe cases which were of viral origin. (Table No.7). This shows the disease is inclined towards the severity. In our study, patients' high risk with ICU admitted were 181 (90.5%) whereas non-ICU admitted patient were 19 (9.5%). (Table No.8) Maximum patients need ICU support, intubation, oxygen support same has been reported by Soumyen *et al.* (2015)[22].

In our study, patients high risk with not intubated during hospitalization were 147 (73.5%) whereas intubated patient during hospitalization were 52 (26%) (Table No.9). So, there is need of bulk of ventilators in the hospitals (Kumar R *et al* 2014)[29].

In our study, patients' high risk with oxygen support during hospitalization were 165 (82.5%) whereas. (Table No.10.) it shows that this disease is oxygen dependent. So, there is a requirement of oxygen supporting devices in the hospitals.

In our study, patients' high risk with radiological investigation were 119 (59.5%) whereas non radiological investigated patients were 81 (40.5%). (Table No.11) In maximum patient radiological findings were found, same has been supported by findings of Saumyen *et al.* (2015) [22].

In our study, patients' high risk with vaccine received were 152 (76 %) whereas non vaccinated patients were 48 (24%) and partially vaccinated patients were 68 (34%). (Table No.12) This finding is similar to Kamble *et al* (2016) where immunized persons were most affected[24].

We found that, patients with ADEM were 4 (2%), Aseptic Meningitis were 4 (2%), Dyselectrolytemia were 17 (8.5%), Heat Stroke-1 (0.5%), Herpes 29 (14.5), Hypoglycaemia 49 (24.5%), Japanese Encephalitis-75 (37.5%), Mumps-7 (3.5%), Scrub Typus-1 (0.5) and Unknown were 13 (6.5%). (Table No.13). Majority of the case is viral in origin and JE has highest in prevalence having 75 (37.5%) followed by hypoglycemia in the region of Muzaffarpur (Fig.6). It may be due to litchi toxin, suggesting litchi connection. This finding is similar to findings reported in https://www.civilsdaily.com/burning-issue-acute encephalitis-syndrome-aes/[1].

Out of 200 patients, 91(45.5%) were hospitalized in PMCH, 89(44.5%) in SKMCH, 18 (9%) in AIIMS-Patna and 02 (1%) in IGIMS. (Table No.14). In PMCH all the cases of AES were found to be of age between 1year to 15 years. But In AIIMS Patna, this age limit failed. As there were also adult patients upto age 68. In PMCH, causes of AES were diverse, but in AIIMS Patna, majority of cases were due to JE (viral origin). In SKMCH, Muzaffarpur the causative factor was non-viral

in origin (Hypoglycemia, Dyselectrolytemia). It might be due to toxin in Litchi. Despite the best efforts of national and international health agencies and research organizations, no tangible solution has been proposed as of yet.

Since various etiological theories have been put forth but nothing decisively came up. Therefore, in light of this, we attempted to establish a correlation between the characteristics of CB with diseases having the similar clinical conditions described in Unani literature. A general clinical picture of *Sarsam* is mentioned by many Unani Scholars in their books. We find that all features of *Sarsam/Warme Dimagh* closely resemble the exact features of CB/AES. The clinical feature such as delusion, mental confusion, delirium, fear and restlessness, along with unnecessary laughing or weeping are usually manifested in both *Sarsam* and CB. These symptoms can be followed by severe headache, nausea, vomiting, facial erythema, redness in the eyes, dental grinding, faecal and urinary incontinence, shouting due to intense pain and spasms and ultimately lead to unconsciousness or coma in the final stage before death.

All the nine manifestations of *Sarsam* are strikingly similar to the manifestation of CB. (Table No.15). Same has been reported by Ibran *et al* (2024). There are some other pathological conditions in Unani system of medicine which are described as the last state of *Sarsam* these conditions are termed as *Subaat* and *Jumood* and these two conditions closely resembled the Coma and 'catalapsy' (unconsciousness) which is seen in last stage of acute encephalitic syndrome. (Table no.16-17) [5-21,30].

The difference between two terminology is that if the inflammatory process involves the fore brain it is called "*Subaat*" - it is due to "*Buroodat* and *Rutoobat*" either *Sada* or *Maddi*. And when their process involved in the "Hind Brain" then the condition is termed as *Jumood* and it is due to "*Buroodat & Yaboosat*" either sada or *maddi*. Hakim Akbar Arzani and others claimed that the inflammatory process sometimes involves one portion of brain only and some time it involves the whole brain as well and sometimes it involves the brain only and the meninges only and sometime involve the both depending on the clinical presentation[6,14].

The pathological site identified in this context they explained that if the inflammatory process involves the forebrain, the eyes of the patient will be partially opened and the patients moved his hand in the air, as he is trying to catch the flies along with cardinal symptoms of "*sarsam* and *chamki bukhar*" If the midbrain is involved then the additional symptom will be marked as delusion and forget fullness along with the urinary or faecal incontinence. In case of hind brain involvement, the additional symptoms will be mild headache, sleeplessness, irritability, delirium, behavioural disorders, severe headache, nausea, vomiting and the mental confusion etc. *Sarsam* classified in four types as per temperament, i.e., *Faranitus, Faranitus Khalis, Sarsame Saudavi* and *Lesarghus,* all have convincing similarities with *Chamki Bukhar*/AES in their presentation. In this way the management offered for *Sarsam* with all their types can be applied to the patients of *Chamki Bukhar*.

Numerous single herbs, non-pharmacopo eial compound formulations and classical compound formulations have been advocated in Unani medicine for the management of all the above four types of Sarsam, dozens of regimens like venesection, *tabreede raas, mushil, huqna, lakhlakha, mushil-munzij therapy, massage, nutool, pashoya, zimad, Takmeed* and *taskheen* along with dietary supplements, housing standards, lifestyle management and rest have been advised profoundly (Table No.18-21).

On the basis of this convincing similarities and symptomatic approach, the Govt. of Bihar issued an Unani SOP to manage *Chamki Bukhar*[30-31]. None of the measures are currently in use, despite their significant theoretical resemblance. The aforementioned management is recommended and proposed for use in *Chamki Bukhar*. At the very least, multistage trials must be conducted to ensure the adoption of evidence-based practice.

CONCLUSION

Based on the observations made and the results acquired, it is possible to draw the following conclusions;

- High risk exposure was reported has association with Pig-110 (55%), Paddy-196 (98%), Poultry-195 (97.5%), Litchi-178 (89%) exposure, malnutrition -174 (87%). Association with litchi is quite strong.
- Major symptoms were Fever - 200(100%), Cough- 39 (19.5%), breathing difficulties - 82 (41%), Body ache - 57 (28.5%), vomiting - 136 (68%), chills - 73 (36.5%), shivering - 136 (68%), Headache - 136 (68%), delirium - 179 (89.5%), convulsion - 184 (92%) and coma - 186 (93%) patient. These symptoms are almost similar to symptoms found in *Sarsam* and *Warme dimagh* mentioned in Unani Medicine.
- According to Unani texts, the typical symptoms of *Sarsam* and *warme dimagh* are very similar to those of *Chamki Bukhar* / AES. These symptoms include hallucinations, mental disorientation, delirium, anxiety, restlessness, uncontrollable laughter or tears, severe headache, nausea, vomiting, facial redness, red eyes, grinding of the teeth, incontinence of both feces and urine, screaming from severe pain and spasms, and finally, unconsciousness or coma in the last stages before death. All nine Sarsam manifestations resemble CB.
- Other pathological conditions in Unani medicine were described as the last state of *Sarsam*- these conditions are called *Subaat* and *Jumood* and they closely resemble the coma and 'catalapsy' (unconsciousness) seen in CB/AES.
- *Sarsam's* four types - *Faranitus, Faranitus Khalis, Saudavi*, and *Lesarghus* - resemble CB/AES in presentation. Thus, CB patients can receive all *Sarsam* management. Unani recommends dozens of regimens, including venesection, *tabreede raas, mushil, huqna, lakhlakha, mushil-munzij* therapy, massage, *nutool, pashoya, zimad, takmeed* and

taskheen, along with dietary supplements, housing standards, lifestyle management and rest for all four types of Sarsam.

- None of the above measures are currently in use, despite their significant theoretical resemblance the aforementioned management is recommended and proposed for use in CB. At the very least multistage trials must be conducted to ensure the adoption of evidence-based practice.
- To ensure evidence-based utility, various drugs, regimens, techniques and other treatment modalities must be extensively examined for CB. Epidemiological trials in Unani medicine are scarce, highlighting the necessity for them.

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