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Prevalence of indicators of renal and urinary disorders among select nomad tribal populations

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ABSTRACT

Background: The prevalence and incidence of renal kidney disease in developing countries are at the increase. The lack of knowledge becomes an stumbling block to the adoption of preventive measures which may be of great help to the asymptomatic subjects .Urinalysis, a simple and inexpensive test, remains a basis in the evaluation of the kidney functioning and may easily be employed for screening population for renal abnormalities. **Objectives:** Urinalysis was done to evaluate the indicators of renal and urinary abnormalities among select Nomad Tribal Populations of Rajasthan, India. **Methods:** 1142 persons (526 males and 616 females) aged >18 years were examined from a cluster of three districts i.e. Jhunjhunu, Sikar and Churu. The urine examination emphasized the collection of mid-stream clean catch urine for chemical analysis by urine Xpress dipstick method. **Results:** Apparently healthy subjects were screened for urinalysis. Renal and urinary abnormalities were detected in 3054 subjects. The most common form of urinary abnormality was hematuria (38.1 %) This was found in 435 subjects. Other renal abnormalities were leucocyturia (34.2%) and proteinuria (25.7%). **Conclusion:** This was the first urinalysis screening study on these populations that define the asymptomatic individuals for various risks for renal diseases. A confirmatory test is further required for proper diagnosis of the renal diseases.

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1. Introduction

Chronic kidney disease (CKD) is a serious condition associated with premature mortality, decreased quality of life, and increased health-care expenditures. Untreated CKD can result in end-stage renal disease and necessitate dialysis or kidney transplantation. Risk factors for CKD include cardiovascular disease, diabetes, hypertension, and obesity [1-3]. A urinalysis is a simple, inexpensive test that can help to detect problems in many parts of your body including your kidneys and urinary tract, your heart and your liver. A urinalysis can help to detect many diseases before symptoms occur. Early detection and treatment can often prevent serious diseases from getting worse. Several studies have been made using reagent strips, documenting their effectiveness in

detecting urinary abnormalities at relatively low cost [4-9]. The rural and tribal populations in India face considerable disparity as compared to urban populations in terms of health facilities, education and economic pursuits. Health care is one of the most important of all human endeavors to improve the quality of life especially of the tribal people [10,11,12,13]. It implies the provision of conditions for normal, physical and mental development and functioning of human being individually as well as in a group. A great realization has come from the medical scientists that human being can no longer be treated as an anatomical and physiological entity, and that man's individuality should be understood in terms of perceptions, culture and belief system. Tribal health system and medical knowledge over the ages, which is known as traditional health care system, depend both on the herbal and psycho-somatic lines of treatment. While flowers, plants, seeds, animals and other naturally available substances formed the major basis of treatment, this practice always had a touch of mysticism, supernatural and magic, often resulting in specific magico-religious rites. Faith healing has always been a part of the traditional treatment in the tribal health care system.

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Studies by anthropologists indicate that traditional medicines do exist and persist even though the health consumer has now access to western medicine. There is a need to scientifically study the traditional tribal medicine and healing systems and combine them with modern allopathy system so as to make it available and affordable for the poor tribal population. I used dipstick methods to screen apparently healthy subjects; As I consider this to be the preliminary stage in an articulated plan aimed at identifying early enough those persons at risk of developing chronic renal diseases, with the final aim of setting in motion a large scale preventive protocol which over the next few years will help reduce the number of patients in these communities who will reach end stage renal failure

2. Materials and Methods

The present study has been conducted among Jhunjhunu, Sikar and Churu districts of Rajasthan State. In these major districts the tribal population are huge and a majority of nomad population had been living in the outskirts of cities most of them have permanent illegal residence. The younger population of tribes keeps on roaming in the search of work whereas the elder populations stayed back and look after the house and children. The initial contact with tribals' living conditions and life styles was through elders of tribal community and other people living in and around tribal habitations. As the exact percentage and location of nomadic population of Shekhawati region was not known snow and ball method of sampling was used for data collection. It was not easy though to locate their places of living because they had been living away from easily accessible locations or open public view. It had taken repeat rounds to trace more and more such nomad habitations. A total of 1142 males and females ranging in age 18-100 years were studied (males, n = 526 and females, n =616). Both the males and females were mostly working in brick kilns, road side construction, as agricultural laborers on daily wage basis. Only those subjects were studied who volunteered for it after the procedure and purpose was explained to them. Informed consent was obtained from each subject. All the subjects were apparently healthy with no visible deformity.

2.1. Urinalysis Procedure

The urinalysis test involves the collection of urine sample in a specimen cup. The proper collection of a sample is very important in order to avoid contamination of urine. The collection technique is different for men and women. Proper instructions were given to both the sexes for collecting their urine sample. For men, it was told that the opening of the urethra (tip of the penis) should be wiped clean with a cleansing wipe before collection is begun. In women, it was instructed that the area around the urethra should be wiped clean with a cleansing wipe. Then she was asked to spreads the labia of the external genitalia and wipes from front to back. After the urethra was properly cleaned, the collection begins by discarding the initial stream of urine into the toilet. Then, 10-15 milliliters (ml) of urine was collected in the sterile specimen cup by directly urinating into the cup. Once an adequate amount was collected, then the remaining urine was voided in the toilet. This technique is called the mid-stream clean catch urine sample collection.

2.2. Urine Dipstick Chemical Analysis

The urine dipstick is a rapid test used to analyze urine. A dipstick (Xpress) is a thin plastic strip which has several small squares of different colors attached to it. There are about 10 squares on each strip with each square measuring about a quarter of an inch. The dipstick is simply inserted into the specimen cup containing the urine briefly (for 60 seconds) and then it is inserted into accurex machine for interpretation.

The squares on the dipstick contain specific chemicals that react differently when they come in contact with urine. Each color measures one important quality of the urine.

The study was approved by the institutional human ethics committee at BITS, Pilani, Rajasthan, India and performed according to the Declaration of Helsinki [14]. All study members were given detailed explanation of the study in their regional language before obtaining their written consent

3. Results

The study is conducted in three districts of Rajasthan among different caste of Nomad Populations scattered in different locations are given below. Table 1. The percentage frequency distributions of study population among different nomad tribes are given below in pie chart 1. It has been found that 43% of Natt tribes followed by 32% of Banjara and so on.

Table 1. Distribution of Nomad Tribal Populations among Three Select Districts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Jhunjhunu	658	57.6	57.6	57.6
	Sikar	398	34.9	34.9	92.5
	Churu	86	7.5	7.5	100.0
	Total	1142	100.0	100.0	

Figure 1. Pie Chart Shows the Frequency Distribution of Study Population among Different Nomad Tribes

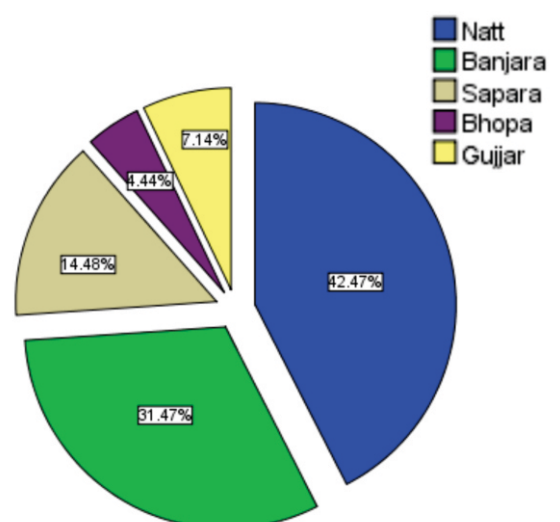


Figure 2 shows diagrammatically the design of the study. Apparently healthy subjects were enrolled in the study. The mean+SD and median age of the study population were respectively 43.66+ 18.1 and 40.0; there were 526(46.1%) males and 616(53.9%) females. The age and sex wise distribution of the study population is given in Bar chart 3.

Figure 2: Illustration of the Subsequent Phases of the Study

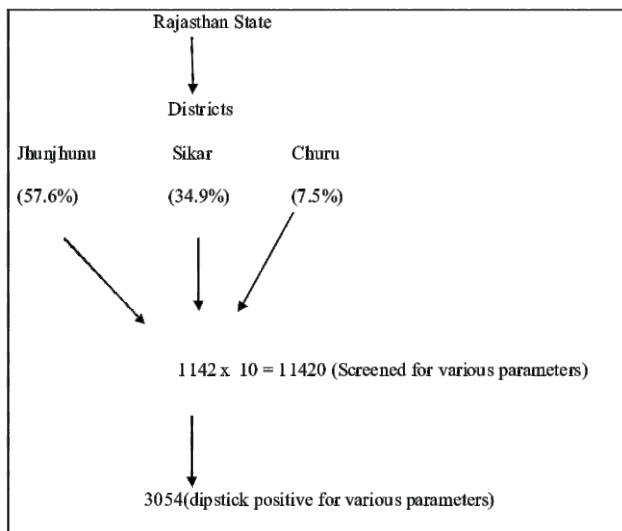
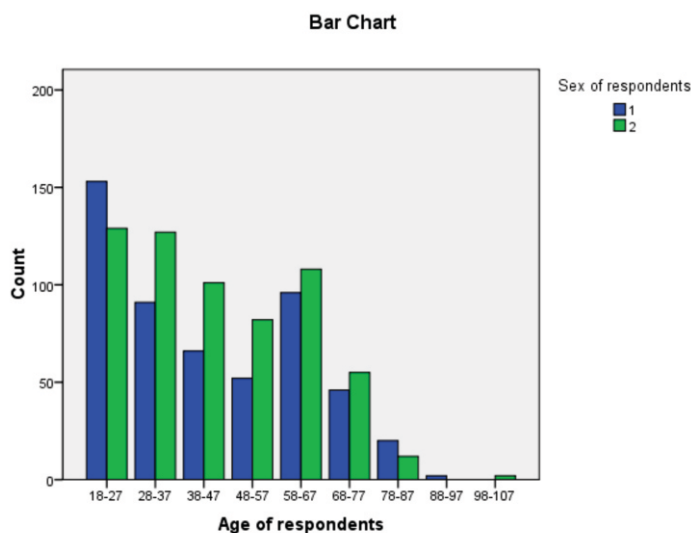


Figure 3. Bar Chart Shows the Age and Sex-Wise Distribution among Nomad Tribal Populations



Urinary abnormalities were found at screening in 1142 subjects for different parameters: the distribution of various urinary abnormalities are given in table 2

Table 2. Urinary Findings at Screening

Urinary Findings	Number of subjects	Percentage of population
Hematuria	435	38.1
Leukocyturia	391	34.2
Nitrite	069	06.0
Bilirubin	426	22.7
Urobilinogen	253	22.1
Ketonuria	036	03.2
Glucosuria	09	0.8
Proteinuria	293	25.7
Acidiosis	907	79.4
Alkalosis	125	10.9
Neutral	110	9.6
Total	3054	26.7

4. Discussion

Tribal health is an important aspect of development and progress of the people. Tribal communities, in general, and the primitive tribal groups in particular are highly disease prone, and do not have required access to basic health facilities. They are mostly exploited, neglected, and vulnerable to various diseases with high degree of malnutrition, morbidity and mortality [15]. Their misery is compounded by poverty, illiteracy, ignorance of the causes of diseases, hostile environment, poor sanitation, lack of safe drinking water and blind beliefs, etc [16]. The present study highlights that socio-economic transition along with lifestyle modifications can result in urgent health problems even in a select primitive tribal groups like Banjara, Natt, Bhopa, Sapera and Gujjar. This is the first study to conduct a screening of renal and urinary disorders parameters among these populations. It shows that through an extended information, mass screening of the population for renal ailments is feasible in a developing country and can provide useful information on the frequency of renal diseases. Our results show, however, that among apparently healthy subjects among these populations there is a considerable incidence of renal abnormalities as reflected by the abnormal dipstick findings. Similar condition regarding another primitive tribe like Saharia as recently studied by [16], shows genetic disease burden, nutrition and determinants of tribal health care in chhattisgarh state of central-east India. These socio-economically deprived population represents co-occurrence of various life style related diseases like high blood sugar level, high blood pressure and high fat percentage pointing towards beginning of metabolic syndrome which is very distinct and recent phenomenon among primitive tribal group and is well known risk factors associated with renal abnormalities [17,18]. On one hand the these populations are fighting with hunger and infectious diseases due to poor basic health amenities and on the other hand they may also be burdened with the costly treatment of diabetes and

hypertension considered to be disease relegated among the affluent societies so far. As the findings of the present study indicates that these population are suffering from various renal disorder indicators which are known to be the systems of various renal and urinary abnormalities.

5. Conclusion

A wider coverage of these populations could have given a comprehensive profile of the status of indicators of renal disorders among these primitive tribal groups, however, time framework and further clinical diagnosis of the study was an important requisite. Carefully conducted prospective studies including clinical diagnosis are needed to further our understanding and to determine among them the contributing factor in the pathogenesis of renal diseases. Life style oriented health problem which requires constant monitoring and regular medication which would be very difficult in these socio-economically deprived populations with very limited health care facilities. More studies on these populations with major focus on renal diseases which are known to be the resultant of metabolic disorder especially type 2 diabetes mellitus are required for making preventive strategies.

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