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Research Article

**IMUNOCHROMATOGRAPHIC (ICT) STRIP AS A SIMPLE,  
RELIABLE, EFFECTIVE AND EASY DIAGNOSIS TOOL FOR  
KALA-AZAR IN THE SUBJECT POPULATION**<sup>1</sup>Dr. Bilal Ahmad Khan Niazi, <sup>2</sup>Dr Ifra Rafaqat, <sup>3</sup>Dr. Abdul Haseeb Khan<sup>1</sup>District Sargodha<sup>2</sup>Children Hospital and Institute of Child health.<sup>3</sup>District Head Quarter Hospital Sahiwal**Abstract:**

**Objectives:** Quick ICT is reachable for the check of quality of the proteins which produces immune response and known as antibody against the flagellate protozoan with the use of an organism in which genetic rK39 antigen recombination has occurred.

**Methodology:** The participants of the study were one hundred in which sixty participants were the admitted patients. Research was carried out at Allied Hospital, Faisalabad (September, 2016 to August, 2017). It was prescribed that there are chances of availability kala-azar (leishmaniasis of the viscera) in them. In addition to those hundred patients, forty healthy people were evaluated to check the reliability of the immunochromatographic dipstick test. Spleen coating was gathered from all the available patients in the hospital to check the occurrence of the LD bodies with the help of particular medical instrument. A standard or model was made on the basis on patients who were found positive. These positive patients proved the occurrence of the leishmaniasis of the viscera.

**Results:** There were total sixty patients under discussion. More than eighty percent sufferers were discovered as smear positive and more than ninety eight percent patients were found positive in ICT. All the positive smear patients were also positive in the ICT. Forty healthy people were selected as controls in which 20 controls were selected from the area of disease and 20 participants were selected from the area of non-disease zone of leishmaniasis of the viscera. They were found negative in the ICT. Sensitivity of the ICT was hundred percent and specificity of the ICT was found near about eighty seven percent.

**Conclusion:** This research proved the reliability, simplicity and easy method of the ICT to check the kala-azar in the disease threatening areas.

**Key Words:** leishmaniasis, viscera-azar, rK39. ICT, LD, flagellate, protozoan, intensity, recombination, antibody.

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**INTRODUCTION:**

Leishmaniasis of the viscera abbreviated as VL and also known as kala azar of India is a paramedic spread by parasite donovani leishmania. The agent which is the cause of spread of this disease is sand fly belongs to a specific origin of species. This disease is wide spread in almost all parts of the earth except on continent Australia and terrorizes three hundred and fifty million humans of the world. Seventy-five thousand deaths of humans occur due to this disease every year.

Nepal and sub continent are responsible of sixty percent of cases in the whole world [1]. The outbreaks of this infection for every 10 years period happening after every fifteen to twenty years [2]. Many studies proved the high and continued occurrence of this disease in the north areas of the country [3].

The detection of visceral leishmaniasis is very complicated issue because its medical aspects are common with the parasites of other diseases. In the recent studies, the detection of the visceral leishmaniasis is carried out with the help of the microscope. The detection of this parasitic infection with the help of the microscope in the smears which are developed from lymph, marrow of bones and spleen are active because of its simplicity and cheapness [4, 5]. Due to the faults in this diagnosis, the promotion of these tests is necessary for the detection of visceral leishmaniasis in the developing countries of the world [7]. The immune tests are progressing for the detection of this disease after the output of the different studies. ICT is being used now on commercial with using of the antigen rK39 [8, 9]. A new gene discovered in this parasite is an innovation in the field with a specific coding [10]. The organism in which genetic recombination has taken place (rK39) is considered as very responsive product in the ICT. The test takes only ten minutes. It is very cheap and simple.

The sensitivity of this antigen in the ICT have been found hundred percent and specificity has been found from ninety three percent to ninety eight percent in all the current studies carried out in India [11, 12]. Hundred participants were interrogated in this study. These hundred participants included both the patients and their healthy control to check the role of this antigen in ICT for the detection of this particular disease.

**METHODOLOGY:**

The proposal of this research was allowed by the review board of Research of Allied Hospital, Faisalabad (September, 2016 to August, 2017). The written willing was obtained from each and every patient and its healthy control. Sixty suspected sufferers of VL of different genders and age group were included in the study for this research.

Smear positive of spleen sufferers were thought to be confirmed patients of this said disease. Different types of the timings were checked for all the participants i.e. clotting, bleeding timing etc. If these timings were found in normal limits, the test of spleen was carried out in this research. Standard methods and extreme anti germs safety measures were carried out for this testing. This spleen testing was carried out by the responsible person of the ward and 3 coatings of spleen were put on aseptic glass by the side of the patient bed. Further testing was carried out in microbiology department on the same day. A special type of lens was used to check the 2 good quality smears.

This test was done on 60 sufferers and 40 healthy people who were acting as their controls. A very small amount of blood was taken from the participants for testing of serum characteristics in the blood.

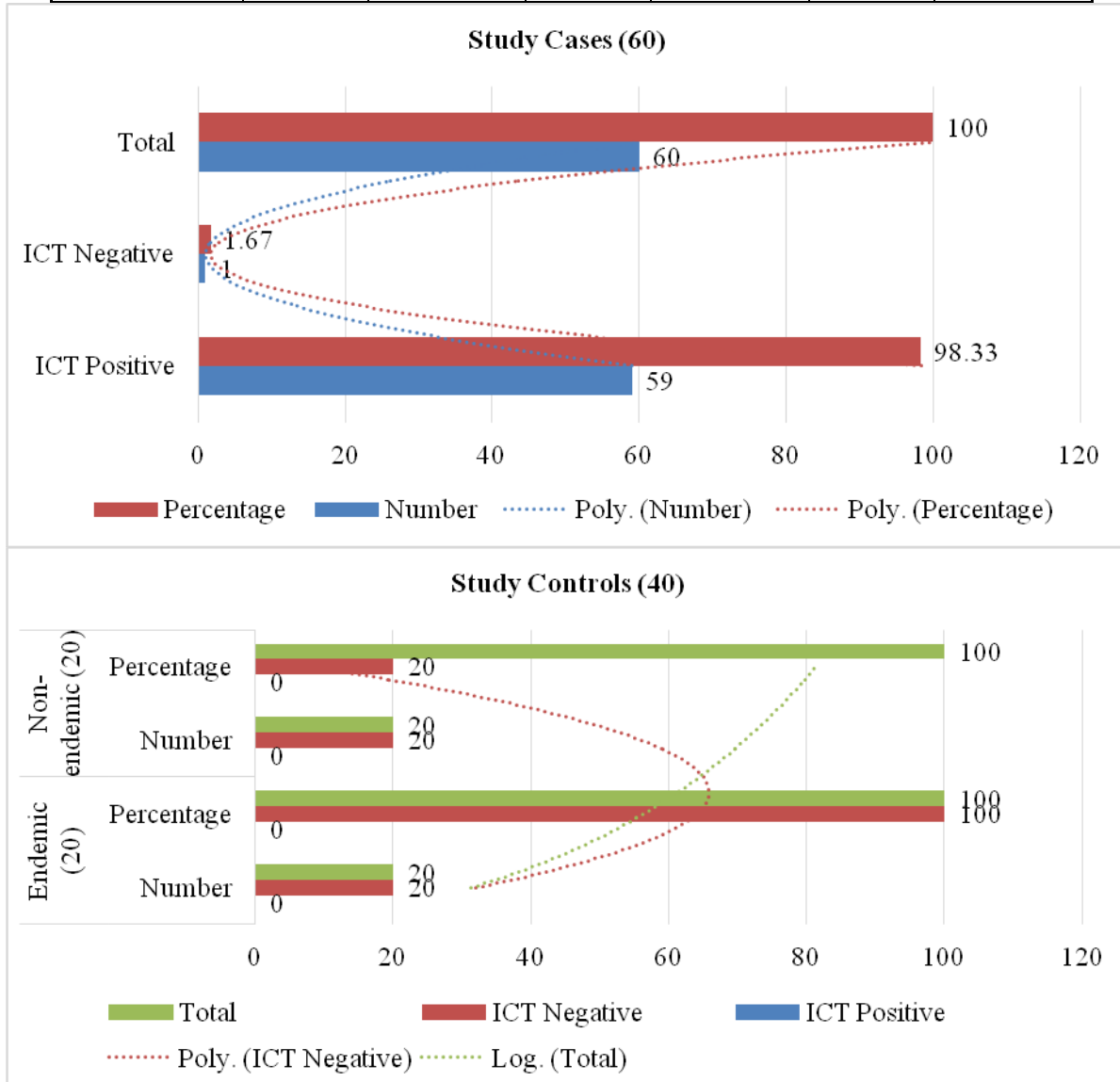
Outcomes of the immunochromatographic dipstick test were announced as negative or positive as described in figure number one.

**RESULTS:**

The participants of the study were separated into 5 groups based upon the age. The 1<sup>st</sup> age group was up to ten years of age; 2<sup>nd</sup> age group was eleven to twenty years of age; 3<sup>rd</sup> age group was twenty-one to thirty years of age; 4<sup>th</sup> age group was from thirty-one to forty years of age and the last group contained the participants of more than forty years of age. The second age group was the biggest group on the basis of participants followed by the 3<sup>rd</sup> group in this matter. The second group was found with thirty percent of the whole subject of the study. Only four participants were present in the last age group.

**Table:** Results of Immunochromatographic dipstick test (ICT) among study population

Findings	Cases (60)		Controls (40)			
	Number	Percentage	Endemic (20)		Non-endemic (20)	
			Number	Percentage	Number	Percentage
ICT Positive	59	98.33	0	0	0	0
ICT Negative	1	1.67	20	100	20	20
Total	60	100	20	100	20	100



Eleven to twenty years participants were founded in largest quantity. The second largest group was twenty-one to thirty years of age. Three persons were found greater than forty years of age. Fifty-three patients were founded with Ld bodies out of sixty patients of visceral leishmaniasis. The report of the ICT test is mentioned in table number one. Fifty-nine persons were found positive in the ICT test and only one participant was found as ICT negative. All the healthy participants were found negative in the ICT test from both affected and non-affected areas. Immunochromatographic dipstick test was found positive in all the smear-positive participants. Sensitivity of the ICT was hundred percent and specificity of the ICT was found near about eighty seven percent.

### DISCUSSION:

Kala-azar is the major difficulty facing by the people of the infected area by this disease. The medical consequences of this disease proved that it is very difficult to detect this disease because it can occur in many conditions. Several amounts of the detection methods are available for the discovery of this disease. There are several confirm advantages and harms of each and every detection method. There are different visible facts and reason for the detection of this disease.

The tests which are used for the testing of the serums are required for the detection of this disease which is able to detect in a simple, precise and costless way. These tests are being used in developing countries for the detection of this disease. In this research, we carry out ICT test with rK39 antigen for all the participants of our study.

More than ninety eight percent patients were found positive in immunochromatographic dipstick test out of 60 who were the suspect of this disease. In opposition to the previous mentioned fact, Immunochromatographic dipstick test was negative in all the healthy people of infected and no infected areas of this disease as mentioned in table number one. The sensitivity of Immunochromatographic dipstick test was hundred percent because all the patients of smear positive subjects were found positive in this case.

Numerous researches are being performed on this ICT test in these days and the outcome of this research is very much reliable with many of these studies [10, 13 – 15]. It is acknowledged fact that the sensitivity of the ICT with rK39 antigen does not remain same in the people living in different areas with different atmospheres [8, 16]. It is apprehending that some subjects were not positive as described by the ICT test; it can be the limitation of this test for the detection of this disease. But the best thing for the implementation of this test is that

the outcome of this test is easily interpretable. There are so many points which are in favour of the ICT test. Therefore, this test is being used in many countries for the detection of the disease in the infected areas.

### CONCLUSION:

Immunochromatographic dipstick test outcomes of this study and the studies carried out in the other countries give the motivation for the implementation of this result. This is cheap, easy to perform and very reliable for the detection of this disease. This research proved the reliability, simplicity and easy method of the ICT to check the kala-azar in the disease threatening areas.

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