INTRODUCTION

In clinical laboratories, the cycles of each test starts with the preparation of patient, and continues with biologic sample collection, preparation and incubation the sample in suitable conditions (temperature) and finally finishes by reporting the result. (Cowan, 2005) it is sometimes necessary to redo a test to obtain a reliable result. Sometimes there is a period of time between sample collection and doing or redoing a test (Tutar, 2002) In this situation the stability of the samples is very important. Since blood tests are more common than the other biologic fluids, therefore using the standard methods for sample collection, incubation and the role of environmental factors that affect the blood’s indices should be considered (Cowan, 2005). Precise temperature control is an absolute necessity in many clinical settings. In clinical laboratory, many specimens are stored in refrigerators or freezer. Refrigerators & freezers should be maintained as per manufacturer guidelines & temperature checks documented(Sarwar, 2006) Accurate calibrated thermometers can be used to verify the accuracy of thermometer used in laboratory. The environmental temperature of the laboratory also raised question about reliability of tests results. The temperature should be maintained at required standard for performing test (Adil, 2005; Zhang, 2004 & Hogman, 1999) whether it is the room temperature, temperature of water bath, refrigerators & air-conditions. A temperature reader should be available to make the regulation of temperature easy for the laboratory workers. Incubators (dry/water) is also used to bring the samples/reagents mixture to proper temperature & maintain it at a proper temperature for amount of time determined necessary for a reaction to take places (Cowan, 2005).Complete blood count (CBC) is one of the most common and routine laboratory tests that is the first step to diagnose an illness and since this test is become easy and quick, it can give valuable information to the physician (Cowan, 2005). The results of CBC can be affected by different factors such as the temperature and incubation period. In another study it has been demonstrated that incubation of blood samples in different temperature leads to considerable alteration in blood cells and red blood cells (RBCs) indices so there should be a complete understanding of how temperature irregularity may affect the laboratory results (Mujeeb, 2006). It is suggested that every laboratories should have written protocol for temperature regulation & acceptable temperature controller storage area must be recorded.

METHOD

The study is a cross sectional survey carried out between September and December 2008. Informed consent was obtained from the laboratory Incharge. Fifteen busy laboratories of Karachi were included, of these 6 were hospital based, 6 commercial and 3 charity laboratories.

Data was collected through a questionnaire. The laboratories were visited during working hours and practices were observed. Data was analyzed by SPSS version 16.

RESULTS

In the 15 labs observed, the mean of complete blood counts performed daily was 1.93± 0.88. All 15 (100%) labs had a temperature reader. All 15 (100%) labs had an air-conditioner installed. Out of these 15, only 12 were found to be in working condition. Out of 15 laboratories 8 (53.3%) of them perform the sample immediately, 2 of the laboratories (13.3%) perform after half an hour, 3 (26.6) perform within 1 hour while 1 (6%) takes more than 1 hour to perform the sample. The finding of this survey showed that some of the CBC parameters can be changed with the variation in temperature; therefore it is better to do the CBC test after blood taking as soon as possible. So, the commercial laboratories should be properly registered and their quality standardized.
Out of 15 laboratories, 8 (53.3%) of them perform the sample immediately, 2 of the laboratories (13.3%) perform after half an hour, 3 (26.6%) perform within 1 hour while 1 (6%) takes more than 1 hour to perform the sample. Control was available in all (100%) labs, but this was used daily in 13 (86.6%) labs and 2 (13.3%) of them uses it when problem arises.

The purpose of this study was to examine the temperature regulation and standardization practices of clinical laboratories in Karachi. The study suggests that standard operating procedures were being followed in the major clinical laboratories in Karachi. Alternative power supply was available in all 15 (100%) labs (Petersen, 1996) which make sure that the composition of the chemicals and blood samples under analysis give authentic results.

DISCUSSION

In this study the effects of temperature regulation of CBC samples was evaluated. Our findings showed that some CBC parameters can be changed with the variation in temperature but Gulati has reported that platelets count did not change up to 4 days incubation at room temperature (Tarar, 2002) Vogelaar et al. that evaluated 304 blood samples of 17-70 years old individuals have reported that incubation blood samples in room temperature for 48 hours did not change the number of RBC, WBC and platelets (Uchida, K., 2000) According to the study of Hirase, the blood cells were stable after one week of incubation (Gulati, 2002), but in Wood's survey the incubation of samples for 24 hours resulted in the increase of WBC counts (Sarwar, 2006) In Zhang study the cause of platelets increasing explained as increase in whole blood viscosity (Tarar, 2002) Uchida in 2000, Shortland in 1997 and Qi in 2001 have reported that raising the temperature leads to changes in platelet’s morphology and movement. (Hirase, Y., 1992; Qi, R.).

It has also been reported in a comprehensive study by Ho et al. that different temperature and time
of incubation can affect in platelets counts and hemoglobin concentrations (Shortland, A. P., 1997)

**CONCLUSION**

The results of this study showed that delay in doing the CBC test can lead to changes in some parameters, therefore the blood samples should not be left in the laboratory and the test should be done on blood samples as soon as possible.

**REFERENCES**
