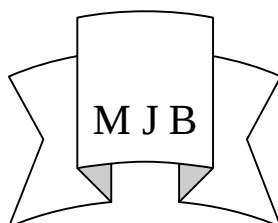


Bacteriological assessment of water samples obtained from water supplies of Babylon hospital for Gynecology and Paediatrics

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Abstract

In this study 128 tap water samples from 14 sites in Babylon hospital for gynecology and pediatrics being obtained.

The results of bacterial investigations have showed that all water samples are free from any pathogenic bacteria, however certain bacteria which are considered as contaminants, non harmful bacteria, were isolated such as *Lactobacillus* and *Micrococcus*. Chlorine conce-

tration is detected in all water samples and it was seen that chlorine concentrations were ranged from (1.2-1.6) P.P.M.

الخلاصة

تم في هذه الدراسة جمع ١٢٨ نموذج من ماء الحنفية من أربعة عشر موقعا في مستشفى بابل للنسائية والأطفال في محافظة بابل.

لقد بينت نتائج التحري البكتيري بان كل نماذج الماء المأخوذة كانت خالية من البكتيريا المرضية ، على أية حال فان بعض أنواع البكتيريا والتي تعتبر كملوثة أو بكتيريا غير مضرّة كانت قد عزلت مثل بكتيريا اللاكتوباسيلس وبكتيريا المايكروكوكس . تم قياس تركيز الكلور في كل نماذج الماء المأخوذة وكانت تتراوح بين ١,٢-١,٦ جزء لكل مليون.

Introduction :

Since bacterial contamination can not be detected by taste, smell, or sight, all water supplies should be tested at least annually for any type of microorganisms [1].

Some bacteria which are found in water are pathogenic to man, others are not but their presence indicates that

the water is contaminated at certain level [2].

Coliform bacteria *Escherichia coli* and *Enterococcus fecalis* are the main indicators of water contamination and such bacteria should be taken in account when the water is supplied for drinking [3].

The presence of certain bacteria in water other than mentioned above will be considered

as contaminants but not real pathogen. However, some authors have listed these bacteria as contaminants and also as opportunistic pathogen especially, immunocompromised patients, for instance *Micrococcus*, *Serratia* and *Lactobacillus* are non-pathogens to man , but such agents require biosafety level differs from Coliform bacteria because some of them can cause a disease in immunocompromised individuals [4].

It was indicated that water can be contaminated by *Serratia* from soil. Moreover, *Micrococcus* has been detected in human skin and also in drinking water [2].

Materials and Methods :

Bacteriological contamination of water has long been a concern to the public. The bacteria which were present in tap water have been investigated especially, the water reached to the wards and units of Babylon hospital for Gynecology and Pediatrics, where the study involved 14 sites in the hospital in addition to the main tap water from July to August 2007.

128 water samples have been obtained from wards and units of the

hospital. All these samples were subjected to bacteriological

investigation by using the traditional methods according to [5]. Chlorine concentration is estimated by using chlorinometer [8].

Results and discussion :

The percentage of chlorination was determined in each obtained water sample, where the percentage in all samples was ranged from (1.2-1.6) P.P.M., the highest value of the chlorination percentage was in the main tap water as shown in table (1).

Also, the bacteriological isolation results by using of an ordinary media has been revealed that all water samples were free from any type of pathogenic bacteria and the water was not contaminated by *E-coli* or by *Enterococcus* where this indicates that the chlorinated water which was reached to the wards and units of the hospital were free from pathogenic bacteria and the chlorination percentage was quite enough to kill all pathogenic causes, especially the infectious causes.

In addition, the results in table (2) has proved that water samples which are obtained from the source of water (one of the water samples) had *Lactobacillus* bacteria which is non-pathogenic and not included within the bacteria that cause water contamination.

Table (1):Concentration of water chlorine in different sources of water in the hospital

Site	Chlorine concentration
Main tap water	1.6
Theaters:(operative, labor)	1.4
Emergency unit	1.4
Premature unit	1.4
Consulatory unit (Pediatrics, gynecology, infertility)	1.4
Laboratory	1.4
Agricultural engineering unit	1.4
Sterilization room in the laboratory	1.4
Female doctors house	1.6
Main kitchen	1.2
Bacteriological unit of the lab.	1.2
Washing unit	1.2
Wards (pediatrics, gynecology, In Infectious diseases, intensive care unit)	1.2
Chlorine concentration range	1.2- 1.6

Moreover, the results of some water samples which were obtained from hospital kitchen ,washing unit, premature, emergency, and laboratory units have two different non-pathogenic bacteria which are *Micrococcus* and *Lactobacillus* where the source of latter may be from the tap water, the absence of any type of pathogenic and non-pathogenic bacteria in the operative theaters and wards indicated the high level of sterilization which was used in this hospital as shown in table (2).

Assessment of water used for drinking depends mainly on the presence of two types of bacteria, Coliform bacteria (*Escherichia coli*) and fecal bacteria *Enterococcus* and since these types of bacteria are not isolated in all water samples subjected in this study, this may

be attributed to that chlorine concentration is sufficient to prevent the growth of the contaminated bacteria [9].

Some researches [4,6] has pointed out that bacterial contamination is usually measured by the fecal coliform levels in the water and it is considered as an indicator organism.

However, it is observed that water samples obtained from six sites in the hospital showed two types of bacteria like, *Lactobacillus* and *Micrococcus* (table 2) which are either isolated together from the same water samples nor separately.

These bacteria are not listed within the contaminants of drinking water [6].Such bacteria reach water supplies from soil or from areas contaminated by them like water tanks [6,7].

Besides, it was seen (as shown in table 2) that *Lactobacillus* and *Micrococcus* are

isolated from sites that water is used largely for washing, sterilization or cooking. So the contamination of water is very simple if it's compared to other sites [6].

Lactobacillus is not recorded within pathogenic bacteria but it is microflora available in the oral cavity of some children during lactation and in the vagina of most women. So human body may play a major source of *Lactobacillus spp.* In the hospital [10].

Table (2) : Results of bacteriological investigation in different sites of the hospital

Site	Number of sample	Pathogenic Bacteria	Non- pathogenic Bacteria	No. of Isolates
Main tap water (domestic water)	8	0	+ (<i>Lactobacillus</i>)	1
Labor wards	6	0	0	0
Operative theater	6	0	0	0
Main kitchen	8	0	+ (<i>Micrococcus</i>)	1
Main laboratory	8	0	+ (mixed <i>obacillus</i> and <i>Micrococcus</i>)	1
Emergency unit	6	0	+ (mixed both <i>Lactobacillus</i> and <i>Micrococcus</i>)	1
Washing unit	8	0	+ (<i>Lactobacillus</i>)	1
Premature unit	6	0	+ (mixed <i>Lactobacillus</i> and <i>Micrococcus</i>)	1
Wards (pediatrics , Gynecology, infectious diseases unit , intensive Care unit)	26	0	0	0
Consolatory unit	24	0	0	0
Agriculture unit	4	0	0	0
Sterilization room in laboratory	6	0	0	0
Laboratory unit	4	0	0	0
Female doctors house	8	0	0	0
Total	128	0	0	6

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