

RESULTS

The results of this study, done to isolate organisms from the oral,subcutaneous, and perianal specimens of 29 children with PCM and 14 healthy children taken as a control,are expressed in the following tables.

Table (1) demonestrates the analysis of the type of disease and sex of PCM children and controls, while table (2) demonestrates the age analysis of them. From this table the age range is up to 36 months.

The isolated organisms from PCM children and controls are shown in tables from 3 - 13. Tables from 3 to 7 show the isolated organisms according to the groups studies.

Table 3 discuss PCM children,where in the all samples candida species are highly significant. In the mouth klebsiella species is the first pathogen isolated (34.5,%), after candida, then staph aureus (31.8%).In the skin staph aureus takes the 1st,place.(37.9% then klebsiella species (31%).In the perianal region E.coli (44.8%),klebsiella species (31 %) then staph auerus are the three main isolated pathogens. After candida species 80 strain) klebsiella species is the predominant organism isolated(28 strain.) as a general.

Table (4) show organisms isolated from marasmic kwashiorkor children where after candida species the main organisms isolated are klebsiella species (37.5 %) in the mouth, and coliform group (87.5%) in the perianal region. Organisms isolated in kwashiorkor are klebsiella species (66.7%) in the mouth, staph aureus (50 %) then klebsiella species in the skin; and coliform group (98 %) in the perianal region. Candida albicans are isolated from all cases.

Table (6) shows the picture of microorganism in marasmus. In all sites candida species are the most dominant isolate. In the skin staph aureus is isolated from 46.7% of cases, where 73% of cases have coliform bacilli in the perianal region.

Isolated organisms from controls are shown in table 7 where non pathogenic organisms, diphtheroids, nisseria, and sarcina are the dominants. Candida species is also isolated from this group.

Tables 8,9 and 10 discuss the isolated organisms according to the site of sampling either from the mouth, the skin, or the perianal region. In table 8 Gram positive cocci especially staph aureus are isolated more toward marasmic side,

while Gram negative bacilli especially klebsiella are the predominant in kwashiorkor and marasmic kwashiorkor . Table 9 shows that staph aureus is isolated from all cases of 3 rd degree marasmus and 50 % of kwashiorkor patients. In the perianal region there is no sharp difference between groups of the study except the increase in coliform strains toward kwashiorkor and marasmic kwashiorkor

In tables 11, 12 and 13 organisms isolated are discussed according to the groups of age in each site of sampling. In the mouth table 11 shows that Gram positive cocci are more in PCM than in controls, and candida in controls tend to be higher with increase in age. Table 12 shows that staph aureus is isolated more in PCM children in the three age groups compared with controls, and klebsiella species is more in PCM, especially in the first age groups, compared with controls. Table 13 shows that a difference in microbial pattern between groups of this study in the perianal region in relation to age is not present.

Table 14 find the relation between artificial and breast feeding to oral candidiasis in PCM and controls, where candida albicans was isolated in a higher percentage from PCM children who are artific-

ially fed(81%). Oral candidiasis in breast fed PCM are 61.5%. In controls the results are similar, 50% and 16.6%, in artificially and breast fed children respectively taking in consideration that these figures are significantly lower than those of PCM.

Tables 15 and 16 show the relation between oral, cutaneous and perianal candidiasis in PCM where there is a relation between the presence of candida in mouth and perianal region as 62% of cases are either both positive or negative. The relation between skin and perianal region is not clear as only 34% only are both positive or negative.

Lastly table 17 discuss isolated candida species according to the site where it is classified into its subtypes . From this table candida albicans represents 70% of candida species strains isolated from PCM and 92.3% of these isolated from controls. In mouth it is 77.8% of strains isolated from this site, where in skin 62.9% and 69.2 % in the periana region. Candida other than candida albicans are candida tropicalis (10% of total species in PCM), candida guilliermondii (15%) and candida pseudotropicalis (5%). Other candida strains are not isolated in this study.

Table (1)

Classification of the studied cases according to disease

Group	Total		Male		Female	
	No.	%	No.	%	No.	%
kwashiorkor	6	20.7	4	13.8	2	6.9
Marasmus <u>1st</u> deg.	4	13.8	2	6.9	2	6.9
<u>2nd</u> deg.	7	24.1	4	13.8	3	10.35
<u>3rd</u> deg.	4	13.8	1	3.4	3	10.35
Marasmic kwashiorkor	8	27.6	6	20.7	2	6.9
Total	29	100	17	58.6	12	41.4
Control	14	100	7	50	7	50

Table (2)

Classification of the studied cases according to age

	P C M		Control	
	No.	%	No.	%
Less than 12 month	12	41.3	5	35.7
12 - 24 month	9	31	3	21.4
24-36 month	8	27.7	6	42.9
Total	29	100	14	100

Table (3)
Isolated strains according to
disease P.C.M. (29-cases)

Organism	Mouth		Skin		P. A.		Total
	No.	%	No.	%	No.	%	
Staph aureus	4	13.8	11	37.9	4	13.8	19 Strain
Staph epidermidis	2	6.9	5	17.2	3	10.3	10 Strain
Strept pyogens	2	6.9	3	10.3	-	-	5 Strain
Strept fecalis	-	-	-	-	4	13.8	4 Strain
Pneumococci	3	10.3	-	-	-	-	3 Strain
E.coli	1	3.4	-	-	13	44.8	14 Strain
Klibsiella species	10	34.5	9	31	9	31	28 Strain
Citrobacter	-	-	-	-	2	6.9	2 Strain
Serratia	-	-	1	3.4	-	-	1 Strain
Salmonella	-	-	-	-	1	3.4	1 Strain
Pseudomonas	-	-	-	-	2	6.9	2 Strain
Proteus	1	3.4	2	6.9	2	6.9	5 Strain
Nisseria	5	17.2	-	-	-	-	5 Strain
Diphtheroids	6	20.7	4	13.8	3	10.3	13 Strain
Sarcina	2	6.9	3	10.3	1	3.4	6
Strept viridance	3	10.3	-	-	-	-	-3
Candida species	27	93.1	27	93.1	26	89.7	80

P.A. = Perianal region

Results

Table (4)
Isolated strains according to
disease Marasmic kwashiorkor (8 cases)

Organism	Mouth		Skin		P. A.		Total	
	No.	%	No.	%	No.	%	No.	
Staph aureus	-	-	1	12.5	1	12.5	2	Strain
Staph epidermidis	-	-	2	25	2	25	4	Strain
Strept pyogens	-	-	-	-	-	-	-	Strain
Strept fecalis	-	-	-	-	2	25	2	Strain
Pneumococci	2	25	-	-	-	-	2	Strain
E.coli	1	12.5	-	-	4	50	5	Strain
Klebsiella species	3	37.5	2	25	3	37.5	8	Strain
Citrobacter	-	-	-	-	-	-	-	Strain
Serratia	-	-	-	-	-	-	-	Strain
Salmonella	-	-	-	-	-	-	-	Strain
Pseudomonas	-	-	-	-	-	-	-	Strain
Proteus	-	-	2	25	-	-	2	Strain
Nisseria	1	12.5	-	-	-	-	1	Strain
Diphtheroids	1	12.5	1	12.5	1	12.5	3	Strain
Sarcina	1	12.5	1	12.5	-	-	2	Strain
Strept viridance	1	12.5	-	-	-	-	1	Strain
Candida species	8	100	7	87.5	6	75	21	Strain

P.A. = Perianal region

Table (5)
Isolated strains according to
disease Kwashiokor (6 cases)

Organism	Mouth		Skin		P. A.		Total	
	No.	%	No.	%	No.	%	No.	
Staph aureus	-	-	3	50	1	16.7	4	Strain
Staph epidermidis	-	-	1	16.7	-	-	1	Strain
Strept pyogens	1	16.5	1	16.7	-	-	2	Strain
Strept fecalis	-	-	-	-	-	-	-	Strain
Pneumococci	1	16.7	-	-	-	-	1	Strain
E.coli	-	-	-	-	3	50	3	Strain
Klebsiella species	4	66.7	2	33.3	2	33.3	8	Strain
Citrobacter	-	-	-	-	1	16.7	1	Strain
Serratia	-	-	-	-	-	-	-	Strain
Salmonella	-	-	-	-	-	-	-	Strain
Pseudomonas	-	-	-	-	-	-	-	Strain
Proteus	-	-	-	-	1	16.7	1	Strain
Nisseria	-	-	-	-	-	-	-	Strain
Diphtheroids	1	16.7	1	16.7	1	16.7	3	Strain
Garcina	-	-	-	-	-	-	-	Strain
Strept viridance	2	33.3	-	-	-	-	2	Strain
Candida species	6	100	6	100	7	116.7	19	Strain

P.A. = Perianal region

Results

Table (6)
Isolated strains according to
disease Marasmus (15 cases)

Organism	Mouth		Skin		P. A.		Total	
	No.	%	No.	%	No.	%	No.	
Staph aureus	4	26.7	7	46.7	3	20	14	Strain
Staph epidermidis	2	13.3	2	13.3	1	6.7	5	Strain
Strept pyogens	1	6.7	2	13.3	-	-	3	Strain
Strept fecalis	-	-	-	-	2	13.3	2	Strain
Pneumococci	-	-	-	-	-	-	-	Strain
E.coli	-	-	-	-	6	40	6	Strain
Klbiella species	3	20	4	26.7	4	26.7	11	Strain
Citrobacter	-	-	-	-	1	6.7	1	Strain
Serratia	-	-	1	6.7	-	-	1	Strain
Salmonella	-	-	-	-	1	6.7	1	Strain
Pseudomonas	-	-	-	-	2	13.3	2	Strain
Proteus	1	6.7	-	-	1	6.7	2	Strain
Nisseria	4	26.7	-	-	-	-	4	Strain
Diphtheroids	4	26.7	3	20	1	6.7	8	Strain
Garcina	-	-	2	13.3	-	-	2	Strain
Strept viridance	1	6.7	-	-	-	-	1	Strain
Candida species	13	86.7	14	93.3	13	86.7	40	Strain

P.A. = Perianal region

Results

Table (7)
Isolated strains according to
disease control (14 cases)

Organism	Mouth		Skin		P. A.		Total	
	No.	%	No.	%	No.	%	No.	
Staph aureus	1	7.1	1	7.1	3	21.4	5	Strain
Staph epidermidis	2	14.3	5	35.7	2	14.3	9	Strain
Strept pyogens	1	7.1	1	7.1	-	-	2	Strain
Strept fecalis	-	-	-	-	3	21.4	3	Strain
Pneumococci	-	-	-	-	-	-	-	Strain
E.coli	-	-	-	-	5	35.7	5	Strain
Klbsiella species	2	14.3	1	7.1	3	21.4	6	Strain
Citrobacter	-	-	-	--	1	7.1	1	Strain
Serratia	-	-	-	-	-	-	-	Strain
Salmonella	-	-	-	-	--	-	-	Strain
Pseudomonas	-	-	-	-	1	7.1	1	Strain
Proteus	-	-	-	-	1	7.1	1	Strain
Nisseria	3	21.4	-	-	-	-	3	Strain
Diphtheroids	8	57.1	7	50	2	14.3	17	Strain
Sarcina	1	7.1	2	14.3	1	7.1	4	Strain
Strept viridance	4	28.6	-	-	-	-	4	Strain
Candida species	5	35.7	2	14.3	6	42.9	13	Strain

P.A. = Perianal region

Results

Table (8)
Isolated strains according to the site
MOUTH

Organism	Marasmus		Marasmus		Marasmus		Marasmic		Kwashiorkor		Control	
	<u>1st</u> degr.	%	<u>2nd</u> degr.	%	<u>3rd</u> degr.	%	Kwashiork.	%		%		%
Staph aureus	1	23	1	14.3	-	-	-	-	-	-	1	7.1
Staph epidermidis	-	-	1	14.3	1	25	-	-	-	-	2	14.3
Strept pyogens	-	-	-	-	1	25	-	-	1	16.7	1	7.1
Strept fecalis	-	-	-	-	-	-	-	-	-	-	-	-
Pneumococci	-	-	-	-	-	-	2	25	1	16.7	-	-
E.coli	-	-	-	-	-	-	1	12.5	-	-	-	-
Klebsiella species	1	25	1	14.3	1	25	3	37.5	4	66.7	2	14.3
Citrobacter	-	-	-	-	-	-	-	-	-	-	-	-
Serratia	-	-	-	-	-	-	-	-	-	-	-	-
Salmonella	-	-	-	-	-	-	-	-	-	-	-	-
Pseudomonas	-	-	-	-	-	-	-	-	-	-	-	-
Proteus	-	-	1	14.3	-	-	-	-	-	-	-	-
Nisseria	2	50	2	28.6	-	-	1	12.5	-	-	3	21.4
Diphtheroids	-	-	4	57.1	-	-	1	12.5	1	16.7	8	57.1
Sacrcina	-	-	-	-	-	-	1	12.5	-	-	1	7.1
Strept viridance	-	-	1	14.3	-	-	1	12.5	2	33.3	4	28.6
Candida species	4	100	5	71.4	4	100	8	100	6	100	5	35.7

Results

P. A. = Perianal region

Table (9)
Isolated strains according to the site
SKIN

Organism	Marasmus 1st degr.		Marasmus 2nd degr.		Marasmus 3rd degr.		Marasmic Kwashiork.		Kwashiorkor		Control	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Staph aureus	1	25	2	28.6	4	100	1	12.5	3	50	1	7.1
Staph epidermidis	1	25	1	14.3	-	-	2	25	1	16.7	5	35.7
Strept pyogens	1	25	1	14.3	-	-	-	-	1	16.7	1	7.1
Strept fecalis	-	-	-	-	-	-	-	-	-	-	-	-
Pneumococci	-	-	-	-	-	-	-	-	-	-	-	-
E.coli	-	-	-	-	-	-	-	-	-	-	-	-
Klibsiella species	1	25	3	42.9	-	-	2	25	2	33.3	1	7.1
Citrobacter	-	-	-	-	-	-	-	-	-	-	-	-
Serratia	-	-	1	14.3	-	-	-	-	-	-	-	-
Salmonella	-	-	-	-	-	-	-	-	-	-	-	-
Pseudomonas	-	-	-	-	-	-	-	-	-	-	-	-
Proteus	-	-	-	-	-	-	2	25	-	-	-	-
Nisseria	-	-	-	-	-	-	-	-	-	-	-	-
Diphtheroids	1	25	1	14.3	1	25	1	12.5	1	16.7	7	50
Sacrcina	2	50	-	-	-	-	1	12.5	-	-	2	14.3
Strept viridance	-	-	-	-	-	-	-	-	-	-	-	-
Candida species	5	125	5	71.4	4	100	7	87.5	6	100	2	14.3

P. A. = Perianal region

Results

Table (10)
Isolated strains according to the site
Perianal Region

Organism	Marasmus 1st degr.		Marasmus 2nd degr.		Marasmus 3rd degr.		Marasmus Kwashiork.		Kwashiorkor		Control	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Staph aureus	1	25	2	28.6	-	-	1	12.5	1	16.7	3	21.4
Staph epidermidis	-	-	-	-	1	25	2	25	-	-	2	14.3
Strept pyogenes	-	-	-	-	-	-	-	-	-	-	-	-
Strept fecalis	-	-	2	28.6	-	-	2	25	-	-	3	21.4
Pneumococci	-	-	-	-	-	-	-	-	-	-	-	-
E.coli	1	25	4	57.1	1	25	4	50	3	50	5	35.7
Klitsiella species	2	50	1	14.3	1	25	3	37.5	2	33.3	3	21.4
Citrobacter	-	-	1	14.3	-	-	-	-	1	16.7	1	7.1
Serratia	-	-	-	-	-	-	-	-	-	-	-	-
Salmonella	1	25	-	-	-	-	-	-	-	-	-	-
Pseudomonas	-	-	-	-	2	50	-	-	-	-	1	7.1
Proteus	-	-	1	14.3	-	-	-	-	1	16.7	1	7.1
Nisseria	-	-	-	-	-	-	-	-	-	-	-	-
Diphtheroids	-	-	1	14.3	-	-	1	12.5	1	16.7	2	14.3
Sacrcina	-	-	-	-	-	-	-	-	-	-	1	7.1
Strept viridance	-	-	-	-	-	-	-	-	-	-	-	-
Candida species	4	100	6	85.7	3	75	6	75	7	116.7	6	42.9

P. A. = Perianal region

Results

Table (11)
Isolated strains according to age group Mouth

	Less than 12 month				12 month - 24 month				24 month - 36 month			
	P.C.M.		Control		P.C.M.		Control		P.C.M.		Control	
	No.	%	No.	%	No	%	No.	%	No.	%	No.	%
Staph aureus	3	25	-	-	1	11.1	-	-	-	-	1	16.7
Staph epidermidis	1	8.3	1	20	1	11.1	-	-	-	-	1	16.7
Strept pyogens	1	8.3	-	-	1	11.1	1	33.3	-	-	-	-
Strept fecalis	-	-	-	-	-	-	-	-	-	-	-	-
Pneumococci	1	8.3	-	-	1	11.1	-	-	1	12.5	-	-
E.coli	-	-	-	-	-	-	-	-	1	12.5	-	-
Klebsiella species	3	25	-	-	4	44.4	1	33.3	3	37.5	1	16.7
Citrobacter	-	-	-	-	-	-	-	-	-	-	-	-
Serratia	-	-	-	-	-	-	-	-	-	-	-	-
Salmonella	-	-	-	-	-	-	-	-	-	-	-	-
Pseudomonas	-	-	-	-	-	-	-	-	-	-	-	-
Proteus	1	8.3	-	-	-	-	-	-	-	-	-	-
Nisseria	3	25	1	20	2	22.2	1	33.3	-	-	1	16.7
Diphtheroids	2	16.6	3	60	1	11.1	2	66.6	3	37.5	3	50
Sacrina	-	-	1	20	-	-	-	-	2	25	-	-
Strept viridance	-	-	2	40	2	22.2	-	-	1	12.5	2	33.3
Candida species.	11	91.7	1	20	9	100	1	33.3	7	87.5	3	50

P. A = Perianal region

Results

Table
Isolated strains according to age group (Skin)

Organism	Less than 12 month				12 month - 24 month				24 month - 36 month			
	P.C.M.		Control		P.C.M.		Control		P.C.M.		Control	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Staph aureus	5	41.7	-	-	4	44.4	1	33.3	2	25	-	-
Staph epidermidis	1	8.3	1	20	1	11.1	2	66.6	3	37.5	2	33.3
Strept pyogens	2	16.6	-	-	1	11.1	-	-	-	-	1	16.7
Strept fecalis	-	-	-	-	-	-	-	-	-	-	-	-
Pneumococci	-	-	-	-	-	-	-	-	-	-	-	-
E.coli	-	-	-	-	-	-	-	-	-	-	-	-
Klebsiella species	5	41.7	-	-	1	11.1	-	-	3	37.5	1	16.7
Citrobacter	-	-	-	-	-	-	-	-	-	-	-	-
Serratia	1	8.3	-	-	-	-	-	-	-	-	-	-
Salmonella	-	-	-	-	-	-	-	-	-	-	-	-
Pseudomonas	-	-	-	-	-	-	-	-	-	-	-	-
Proteus	-	-	-	-	2	22.2	-	-	-	-	-	-
Neisseria	-	-	-	-	-	-	-	-	-	-	-	-
Diphtheroids	1	8.3	3	60	2	22.2	1	33.3	1	12.5	3	50
Sacrina	1	8.3	1	20	2	22.2	-	-	-	-	1	16.7
Strept viridance	-	-	-	-	-	-	-	-	-	-	-	-
Candida species.	12	100	1	20	7	77.8	-	-	8	100	1	16.7

P. A = Perianal region

Results

Table
Isolated strains according to age group
(Perioral region)

Organism	Less than 12 month				12 month - 24 month				24 month - 36 month			
	P.C.M.		Control		P.C.M.		Control		P.C.M.		Control	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Staph aureus	-	-	1	20	2	22.2	1	33.3	2	25	1	16.7
Staph epidermidis	1	8.3	1	20	1	11.1	-	-	1	12.5	1	16.7
Strept pyogens	-	-	-	-	-	-	-	-	-	-	-	-
Strept fecalis	1	8.3	2	4.0	1	11.1	1	33.3	2	25	-	-
Pneumococci	-	-	-	-	-	-	-	-	-	-	-	-
E.coli	3	25	2	40	5	55.6	-	-	5	62.5	3	50
Klbiella species	5	41.7	1	20	3	33.3	-	-	1	12.5	2	33.3
Citrobacter	1	8.3	-	-	1	11.1	-	-	-	-	-	16.7
Serratia	-	-	-	-	-	-	-	-	-	-	-	-
Salmonella	1	8.3	-	-	-	-	-	-	-	-	-	-
Pseudomonas	2	16.6	-	-	-	-	1	33.3	-	-	-	-
Proteus	-	-	-	-	1	11.1	-	-	1	12.5	-	-
Nisseria	-	-	-	-	-	-	-	-	-	-	-	-
Diphtheroids	-	-	1	20	2	22.2	1	33.3	12.5	-	-	-
Sacrina	-	-	-	-	-	-	-	-	1	12.5	1	16.7
Strept viridance	-	-	-	-	-	-	-	-	-	-	-	-
Candida species.	10	83.3	2	40	9	100	1	33.3	7	87.5	3	50

P. A = Perianal region

Results

Table (14)

Relation between artificial and breast feeding
according to candida albicans in mouth

Feeding	P. C. M.			Control		
	N. of cases	Cases +ve cand alb.	%	N. of cases	cases +ve cand alb.	%
breast fed	13	8	61.5	6	1	16.6
Breast fed						
Artificially fed.	16	13	81	8	4	50

Table (15)

Relation between oral and perianal candidiasis in PCM.

Mouth + ve P.A. +ve		Mouth +ve P.A. -ve		Mouth -ve P.A. -ve		Mouth -ve P.A. -ve		Total	
No.	%	No.	%	No.	%	No.	%	No.	%
14	48.3	7	24.1	4	13.8	4	13.8	29	100

P. A. = Perianal region

Table (16)

Relation between cutaneous and perianal candidiasis in P.C.M.

Skin +ve P.A. +ve		Skin +ve P.A. -ve		Skin -ve P.A. +ve		Skin -ve P.A. -ve		Total	
No.	%	No.	%	No.	%	No.	%	No.	%
8	27.6	9	31	10	34.5	2	6.9	29	100

P. A. = perianal region

Table (17) :Candida species According to the site

Site of isolation	Candida albicans	Candida stellatoidea	Candida tropicalis	Candida pseudotropicalis	Candida parapsillosis	Candida guilliermondii	Candida krusei	Candida rugosa	Total
Mouth P.CM	21	-	1	3	-	2	-	-	27
Control	5	-	-	-	-	-	-	-	5
Skin P.CM	17	-	6	-	-	4	-	-	27
control	2	-	-	-	-	-	-	-	2
P.A. P.CM	18	-	1	1	-	6	-	-	26
control	5	-	-	-	1	-	-	-	6
Total P.CM	56	-	8	4	-	12	-	-	80
Control	12	-	-	-	-	1	-	-	13

P. A = Perioral region