RESULTS

TABLE (2)

Comparison between serum immunoglobulins in malnourished children and control.

Variable / Group		IgG mg/dl	IgM mg/dl	IgA mg/dl	IgE ng/dl	IgD u/ml
Control	$\bar{X}$	1514	124.1	117.6	40.3	23
n = 21	Sd	404	25.1	68	38.3	28.8
KWA	$\bar{X}$	1410	146.6	144.8	53.1	64.6
n = 21	Sd	422	30.1	60.6	46.8	51.7
	P	> 0.05	< 0.05	> 0.05	> 0.05	< 0.01
MKWA	$\bar{X}$	1288	144.2	151.5	64.5	46.1
n = 17	Sd	551	42.1	58.9	48.3	58.9
	P	> 0.05	< 0.05	> 0.05	> 0.05	> 0.05
Marasmus	$\bar{X}$	1370	132.2	117.4	45.5	43.8
n = 29	Sd	473	36.3	61.5	38.1	39.1
	P	> 0.05	> 0.05	> 0.05	> 0.05	< 0.05

IgM is significantly elevated in KWA and MKWA groups, and IgD is significantly elevated in KWA and marasmus groups as compared to control group.

TABLE (3)

Comparison between serum immunoglobulins in cases not associated with infection in PCM groups and control

Variable / Group		IgG mg/dl	IgM mg/dl	IgA mg/dl	IgE ng/dl	IgD u/ml
Control	$\bar{X}$	1514	124.1	117.6	40.3	23
n = 21	Sd	404	25.1	68	38.3	28.8
KWA	$\bar{X}$	1364	128.6	121.7	33.1	52.9
n = 10	Sd	471	20.9	47.5	30.0	34.2
	P	> 0.05	> 0.05	> 0.05	> 0.05	< 0.05
MKWA	$\bar{X}$	1224	123.8	131	63.7	46.5
n = 9	Sd	543	46.2	30.1	50.3	60
	P	> 0.05	> 0.05	> 0.05	> 0.05	> 0.05
Marasmus	$\bar{X}$	1379	124	124.3	33.5	42.4
n = 18	Sd	491	40.1	56.2	27.5	40.2
	P	> 0.05	> 0.05	> 0.05	> 0.05	< 0.05

IgD is significantly elevated in KWA and marasmus groups as compared to control group.

TABLE (4)

Comparison between serum immunoglobulinsin cases associated with infection in PCM groups and control.

Variable group		IgG (mg/dl)	IgM (mg/dl)	IgA (mg/dl)	IgE (ng/dl)	IgD (u/ml)
Control	$\bar{X}$	1514	124.1	117.6	40.3	23
n = 21	Sd	404	25.1	68	38.3	28.8
KWA	$\bar{X}$	1451	163	165.8	71.2	75.2
n = 11	Sd	390	28.3	65.5	52.9	63.4
	P	> 0.05	< 0.001	< 0.05	< 0.05	< 0.05
MKWA	$\bar{X}$	1344	167.1	169	65.3	45.6
n = 8	Sd	572	22	73.1	49.4	61.7
	P	> 0.05	< 0.001	< 0.05	> 0.05	> 0.05
Marasmus	$\bar{X}$	1354	145.5	106.2	65.2	46.1
n = 11	Sd	467	25.5	70.6	46.1	39
	P	> 0.05	< 0.05	> 0.05	> 0.05	< 0.05

IgM is significantly elevated in all PCM groups,
IgA is significantly elevated in KWA and MKWA,
IgE is significantly elevated in KWA group,
IgD is significantly elevated in KWA and marasmus groups as compared to control group.

TABLE (5)

Comparison between serum C_3, CIC and opsonic activity of serum in malnourished children and control.

Variable / Group		C_3 (mg/dl)	CIC (ug/ml)	Opsonic activity
Control	$\bar{X}$	103.4	1.79	1.59
n = 21	Sd	24.4	0.42	0.15
KWA	$\bar{X}$	50.6	2.15	1.46
n = 21	Sd	35.4	0.59	0.33
	P	< 0.001	< 0.05	< 0.05
M.KWA	$\bar{X}$	62.4	2.08	1.49
n = 17	Sd	32.6	0.7	0.22
	P	< 0.001	> 0.05	> 0.05
Marasmus	$\bar{X}$	84.2	2.25	1.5
n = 29	Sd	30.2	0.81	0.21
	P	< 0.05	< 0.05	> 0.05

C_3 is lowered significantly in all PCM groups,

CIC is significantly elevated in KWA and marasmus groups,

and Opsonic activity of serum is lowered significantly in KWA group as compared to control group.

TABLE (6)

Comparison between serum C_3, CIC and opsonic activity of serum in cases not associated with infection in different PCM groups and control.

Variable / Group		C_3 (mg/dl)	CIC (ug/ml)	Opsonic activity
Control	$\bar{X}$	103.4	1.79	1.59
n = 21	Sd	24.4	0.42	0.15
KWA	$\bar{X}$	41.7	2.2	1.46
n = 10	Sd	36.5	0.65	0.23
	P	< 0.001	< 0.05	> 0.05
MKWA	$\bar{X}$	62.7	2.13	1.46
n = 9	Sd	40.2	0.97	0.25
	P	< 0.01	> 0.05	> 0.05
Marasmus	$\bar{X}$	79.1	2.32	1.51
n = 18	Sd	30.3	0.97	0.19
	P	< 0.01	< 0.05	> 0.05

C_3 is lowered significantly in all PCM groups , and CIC is elevated significantly in KWA and marasmus group as compared to control group.

TABLE (7)

Comparison between serum C_3, CIC and opsonic activity of serum in cases associated with infection in different PCM groups and control.

Variable / Group		C_3 (mg/dl)	CIC (ug/ml)	Opsonic activity
Control	$\bar{X}$	103.4	1.79	1.59
n = 21	Sd	24.4	0.42	0.15
KWA	$\bar{X}$	58.7	2.11	1.46
n = 11	Sd	34.0	0.56	0.23
	P	< 0.001	> 0.05	< 0.05
MKWA	$\bar{X}$	62	2.02	1.53
n = 8	Sd	24.3	0.24	0.20
	P	< 0.001	< 0.05	> 0.05
Marasmus	$\bar{X}$	90.6	2.15	1.5
n = 11	Sd	29.5	0.45	0.42
	P	> 0.05	< 0.05	> 0.05

C_3 is lowered significantly in KWA and MKWA groups,
CIC is elevated significantly in MKWA and marasmus groups,
and Opsonic activity is lowered significantly in KWA group as compared to control group.

TABLE (8)

Comparison between serum antibody levels of tetanus and measles in malnourished children and control.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
Control	$\bar{X}$	31.1	0.37
n = 21	Sd	59.0	0.30
KWA	$\bar{X}$	46.8	0.29
n = 21	Sd	63.3	0.30
	P	> 0.05	> 0.05
MKWA	$\bar{X}$	47.3	0.16
n = 17	Sd	89.1	0.20
	P	> 0.05	< 0.05
Marasmus	$\bar{X}$	54.5	0.18
n = 29	Sd	114.3	0.27
	P	> 0.05	< 0.05

Measles antibodies are lowered significantly in MKWA and marasmus groups as compared to control group.

TABLE (9)

Comparison between serum antibody levels of tetanus and measles in immunized cases of malnourished children and control.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
Control	$\bar{X}$	40.8	0.45
n = Tet. 16 M. 16	Sd	65.0	0.26
KWA	$\bar{X}$	49.2	0.36
n = Tet. 20 M. 16	Sd	64.0	0.11
	P	> 0.05	< 0.05
MKWA	$\bar{X}$	66.1	0.20
n = Tet. 12 M. 10	Sd	101.2	0.19
	P	> 0.05	< 0.001
Marasmus	$\bar{X}$	71.8	0.34
n = Tet. 22	Sd	127.0	0.34
M. 10	P	> 0.05	> 0.05

Measles antibodies are lowered significantly in KWA and M.KWA groups as compared to control group.

TABLE (10)

Comparison between serum antibody levels of tetanus and measles in cases not associated with infection in different PCM groups and control.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
Control	$\bar{X}$	31.1	0.37
n = 21	Sd	59.0	0.30
KWA	$\bar{X}$	68.6	0.36
n = 10	Sd	74.6	0.28
	P	> 0.05	> 0.05
MKWA	$\bar{X}$	55.4	0.22
n = 9	Sd	81.7	0.19
	P	> 0.05	> 0.05
Marasmus	$\bar{X}$	83.9	0.23
n = 18	Sd	137.7	0.31
	P	> 0.05	> 0.05

No significant difference present.

TABLE (11)

Comparison between serum antibody levels of tetanus and measles in cases associated with infection in different PCM groups and control.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
Control	$\bar{X}$	31.1	0.37
n = 21	Sd	59.0	0.30
KWA	$\bar{X}$	27.1	0.23
n = 11	Sd	45.8	0.32
	P	> 0.05	> 0.05
MKWA	$\bar{X}$	38.2	0.09
n = 8	Sd	101.7	0.20
	P	> 0.05	< 0.01
Marasmus	$\bar{X}$	6.5	0.09
n = 11	Sd	15.5	0.16
	P	< 0.05	< 0.001

Tetanus antibodies are lowered significantly in marasmus group,

Measles antibodies are lowered significantly in MKWA and marasmus groups as compared to control group.

Fig 3: IGG LEVELS IN DIFFERENT GROUPS STUDIED

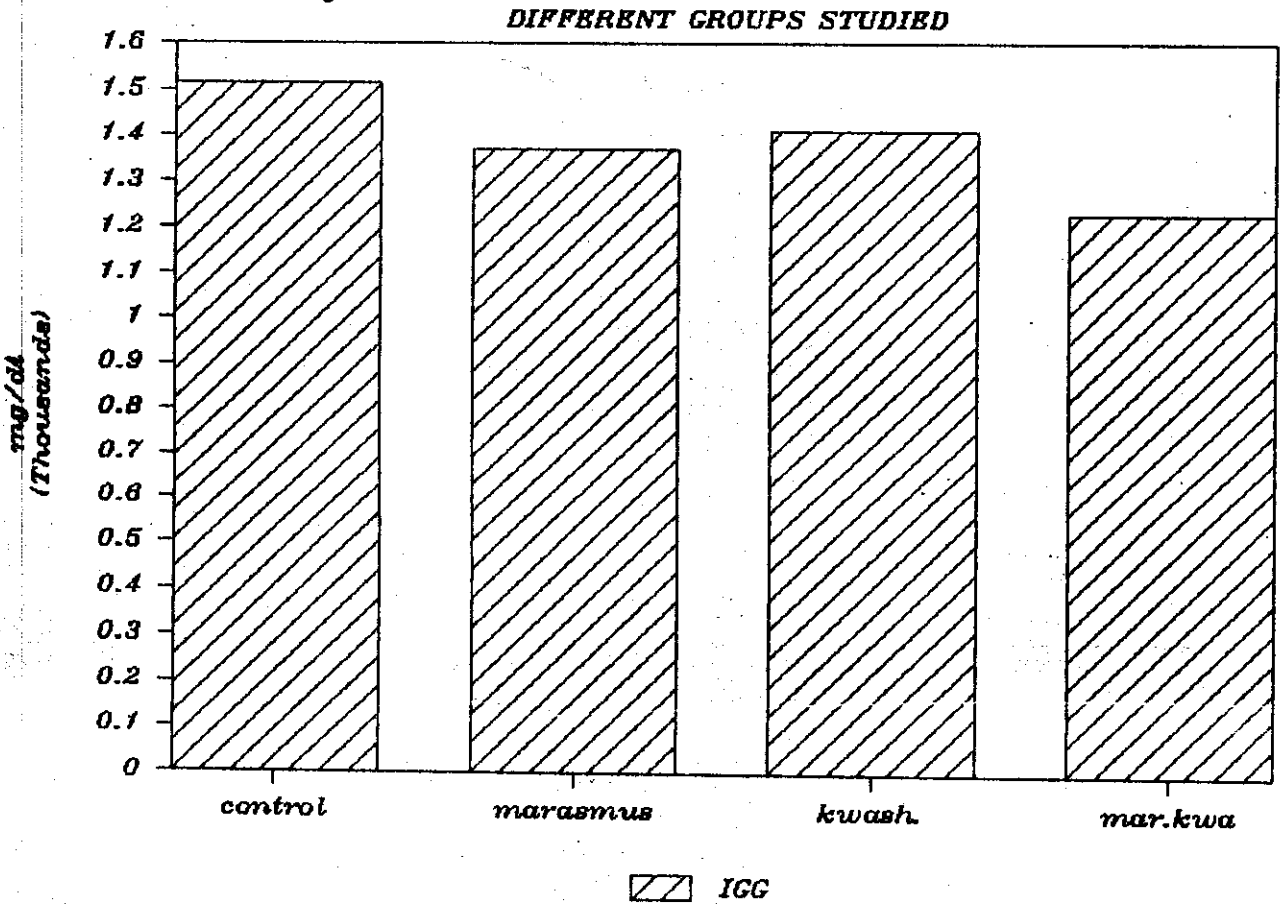

Fig 4 : *LEVELS OF IgE & IgD IN*

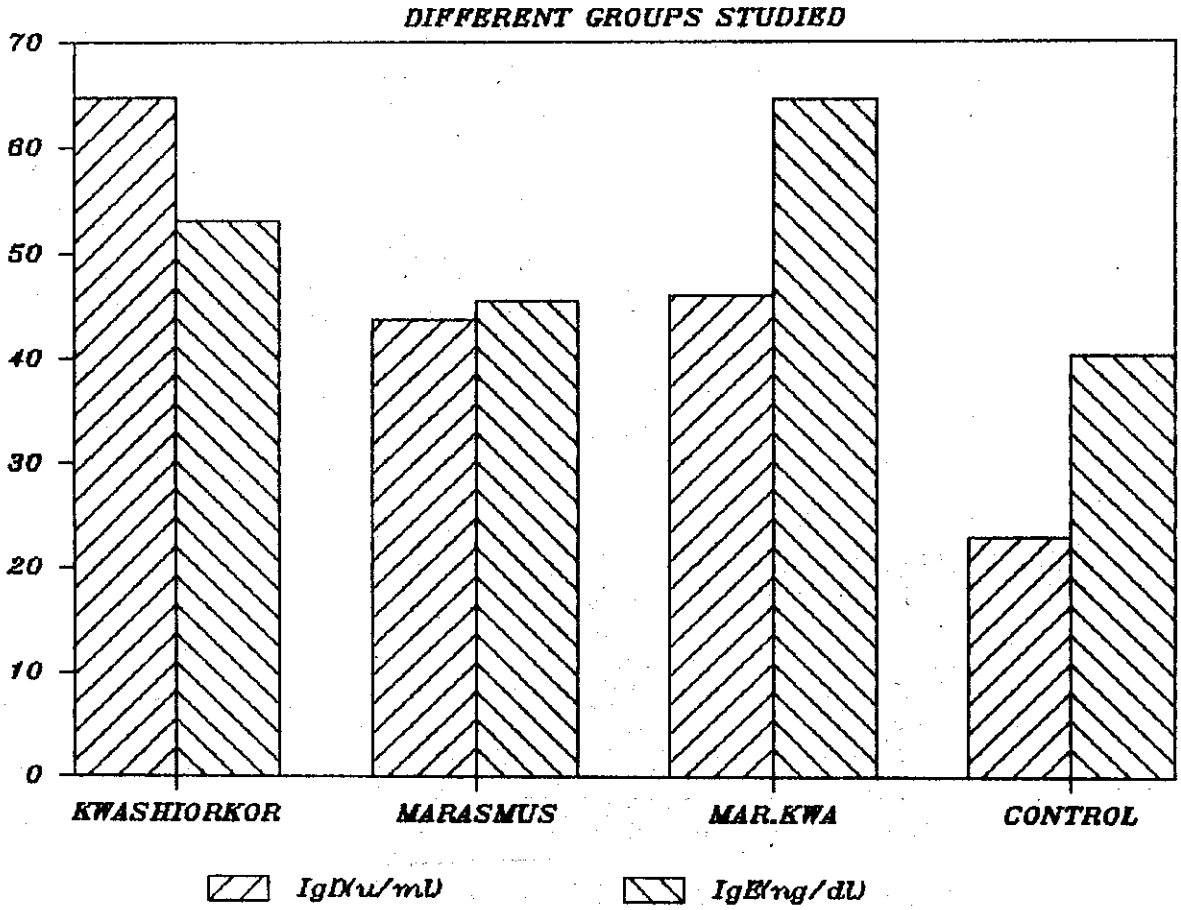

Fig 5 : *LEVELS OF C3 , IgM & IgA IN*

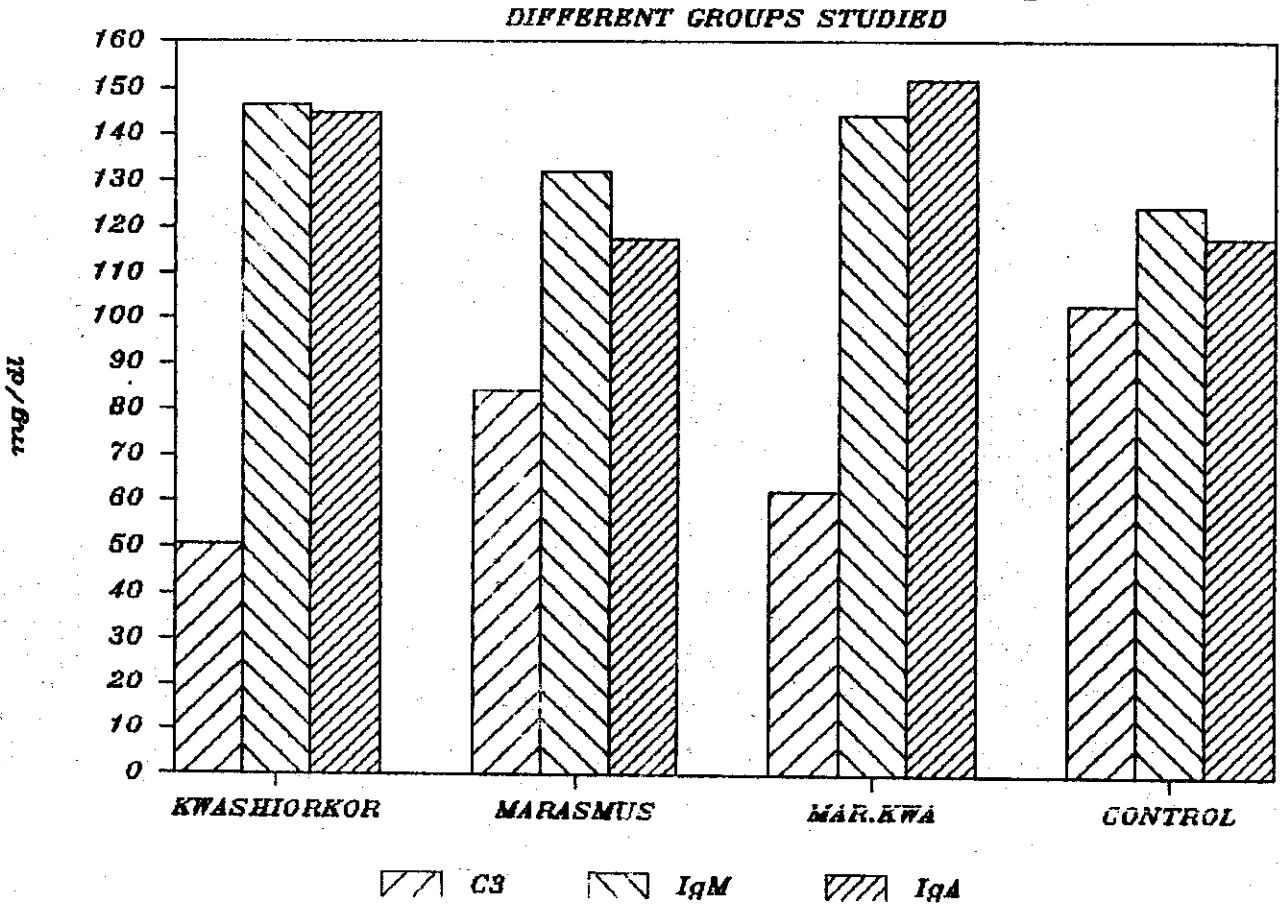

Fig 6: LEVELS OF CIC IN DIFFERENT GROUPS STUDIED

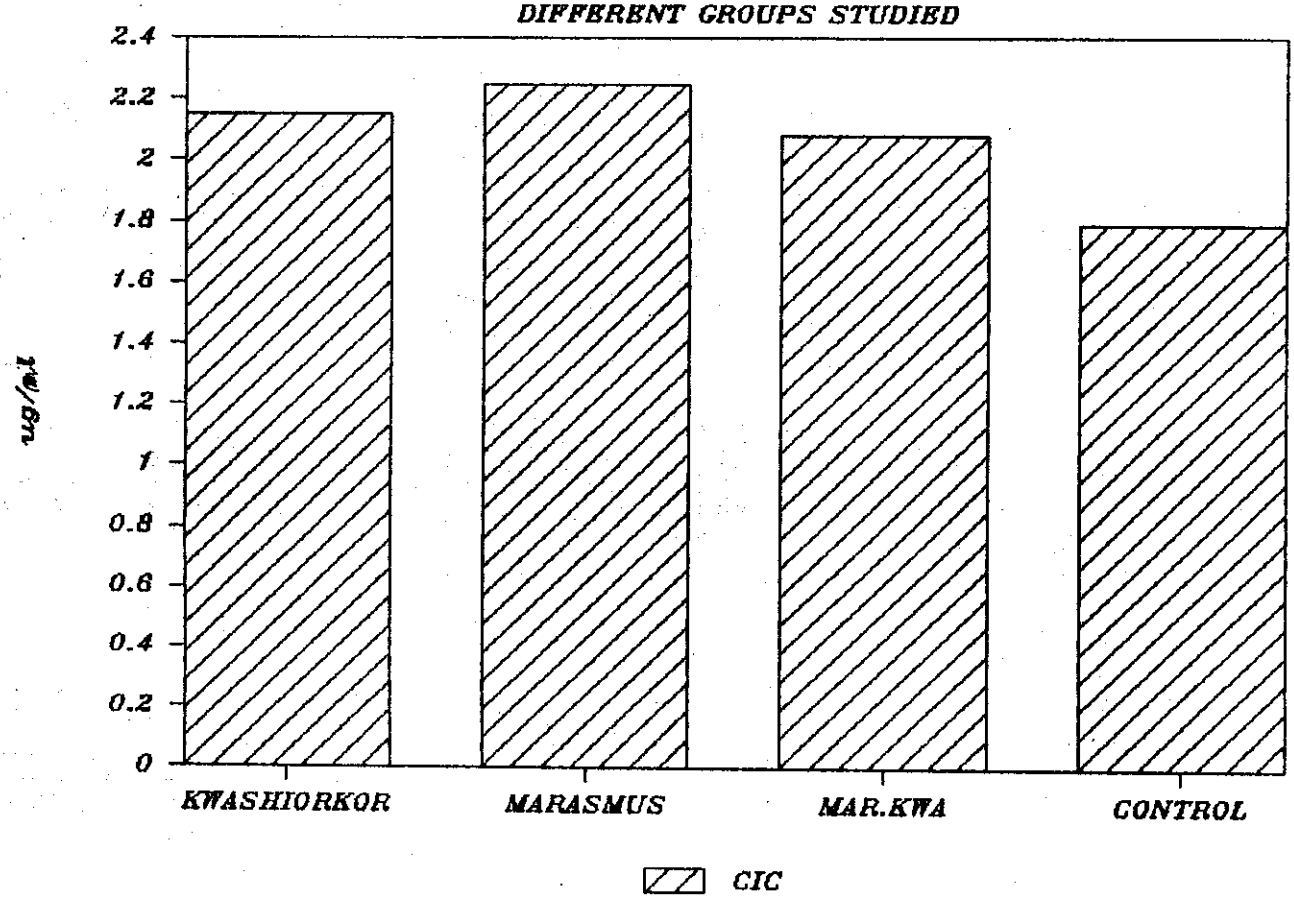

TABLE (12)

Comparison between serum immunoglobulins in marasmus and KWA groups.

Variable / Group		IgG mg/dl	IgM mg/dl	IgA mg/dl	IgE ng/dl	IgD u/ml
Marasmus	$\bar{X}$	1370	132.2	117.4	45.5	43.8
n = 29	Sd	473	36.3	61.5	38.1	39.1
KWA	$\bar{X}$	1410	146.6	144.8	53.1	64.6
n = 21	Sd	422	30.1	60.6	46.8	51.7
	t	0.313	1.528	1.562	0.603	1.550
	P	> 0.05	> 0.05	> 0.05	> 0.05	> 0.05

No significant difference present.

TABLE (13)

Comparison between serum C_3, CIC and opsonizing effects in marasmus and KWA groups.

Variable / Group		C_3 (mg/dl)	CIC (ug/ml)	Opsonic activity
Marasmus	$\bar{X}$	84.275	2.259	1.510
n = 29	Sd	30.272	0.815	0.210
KWA	$\bar{X}$	50.619	2.158	1.464
n = 21	Sd	35.473	0.597	0.232
	t	3.518	0.505	0.709
	P	< 0.01	> 0.05	> 0.05

There is a significant difference between both groups in C_3 ($P < 0.01$).

TABLE (14)

Comparison between serum antibody levels to tetanus and measles in marasmus and KWA groups.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
Marasmus	$\bar{X}$	54.558	0.184
n = 29	Sd	114.334	0.273
KWA	$\bar{X}$	46.866	0.297
n = 21	Sd	63.309	0.308
	t	0.303	1.345
	P	> 0.05	> 0.05

No significant difference present.

TABLE (15)

Comparison between serum antibody levels of tetanus and measles in immunized cases of marasmus and KWA groups.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
Marasmus	$\bar{X}$	71.827	0.349
	Sd	127.025	0.349
KWA	$\bar{X}$	49.21	0.367
	Sd	64.013	0.312
	t	0.738	0.136
	P	> 0.05	> 0.05

No significant difference present.

TABLE (16)

Comparison between serum immunoglobulins in KWA and MKWA groups.

Variable / Group		IgG mg/dl	IgM mg/dl	IgA mg/dl	IgE ng/dl	IgD u/ml
KWA n=21	$\bar{X}$	1410	146.6	144.8	53.1	64.6
	Sd	422	30.1	60.6	46.8	51.7
M.KWA n=17	$\bar{X}$	1228	144.2	151.5	64.5	46.1
	Sd	551	42.1	58.9	48.3	58.9
	t	1.128	0.196	0.348	0.735	1.017
	P	> 0.05	> 0.05	> 0.05	> 0.05	> 0.05

No significant difference present.

TABLE (17)

Comparison between serum C_3, CIC and opsonizing effects of serum in KWA and MKWA groups.

Variable / Group		C_3 (mg/dl)	CIC (ug/ml)	Opsonic activity
KWA n=21	$\bar{X}$	50.619	2.158	1.464
	Sd	35.473	0.597	0.232
M.KWA n=17	$\bar{X}$	62.411	2.081	1.496
	Sd	32.682	0.708	0.228
	t	1.064	0.356	0.421
	P	> 0.05	> 0.05	> 0.05

No significant difference present.

TABLE (18)

Comparison between serum antibody levels of tetanus and measles in KWA and MKWA groups.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
KWA	$\bar{X}$	46.866	0.297
n=21	Sd	63.309	0.308
M.KWA n=17	$\bar{X}$	47.352	0.164
	Sd	89.167	0.205
	t	0.018	1.586
	p	> 0.05	> 0.05

No significant difference present.

TABLE (19)

Comparison between serum antibody levels of tetanus and measles in immunized cases of MKWA and KWA groups.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
M.KWA	$\bar{X}$	66.133	0.205
	Sd	101.255	0.199
KWA	$\bar{X}$	49.21	0.367
	Sd	64.013	0.312
	t	0.519	1.62
	P	> 0.05	> 0.05

No significant differences present.

TABLE (20)

Comparison between serum immunoglobulins in marasmus and MKWA groups.

Variable / Group		IgG mg/dl	IgM mg/dl	IgA mg/dl	IgE ng/dl	IgD u/ml
Marasmus	$\bar{X}$	1370	132.2	117.4	45.5	43.8
n = 29	Sd	473	36.3	61.5	38.1	39.1
M. KWA	$\bar{X}$	1228	144.2	151.5	64.5	46.1
n = 17	Sd	551	42.1	58.9	48.3	58.9
	t	0.881	0.981	1.863	1.382	0.142
	P	> 0.05	> 0.05	< 0.05	> 0.05	> 0.05

There is a significant difference between both groups in IgA ($P < 0.05$).

TABLE (21)

Comparison between serum C_3, CIC, and serum opsonising effects in marasmus and M.KWA groups.

Variable / Group		C_3 (mg/dl)	CIC (ug/ml)	Opsonic activity
Marasmus	$\bar{X}$	84.275	2.259	1.509
n = 29	Sd	30.272	0.815	0.210
M.KWA	$\bar{X}$	62.411	2.081	1.496
n = 17	Sd	32.682	0.708	0.228
	t	2.249	0.776	0.203
	P	< 0.05	> 0.05	> 0.05

There is a significant difference between both groups in C_3 ($P < 0.05$).

TABLE (22)

Comparison between serum antibody levels of tetanus and measles in marasmus and MKWA groups.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
Marasmus	$\bar{X}$	54.558	0.184
n = 29	Sd	114.334	0.273
M.KWA	$\bar{X}$	47.352	0.164
n = 17	Sd	89.167	0.205
	t	0.237	0.272
	P	> 0.05	> 0.05

There is no significant difference present.

TABLE (23)

Comparison between serum antibody level of tetanus and measles in immunized cases of marasmus and MKWA groups.

Variable / Group		Tetanus antibodies (L.f unites/ ml)	Measles antibodies (Measliza units)
Marasmus	$\bar{X}$	71.827	0.349
	Sd	127.025	0.349
M.KWA	$\bar{X}$	66.133	0.205
	Sd	101.255	0.199
	t	0.142	1.131
	P	> 0.05	> 0.05

No significant difference present.

TABLE (24)

Correlation between serum immunoglobulins in KWA group.

KWA n = 21		IgG	IgM	IgA	IgE	IgD
IgG	r	1.000				
	p	-				
IgM	r	.116	1.000			
	p	> 0.05	-			
IgA	r	(-).042	(-).010	1.000		
	p	>0.05	>0.05	-		
IgE	r	(-).032	.436	.220	1.000	
	p	>0.05	<0.05	>0.05	-	
IgD	r	.240	(-).010	.578	(-).001	1.000
	p	>0.05	>0.05	<0.05	>0.05	-

There is a +ve significant correlation between IgM and IgE ($P < 0.05$) and between IgA and IgD ($P<0.05$).

TABLE (25)

Correlation between serum immunglobulins, age, C_3, CIC and opsonizing effects of serum in KWA group.

KWA n = 21		IgG	IgM	IgA	IgE	IgD
C_3	r	.141	.220	.160	.401	(-).091
	p	>0.05	>0.05	>0.05	>0.05	>0.05
CIC	r	.350	(-).111	(-).032	(-).018	.064
	p	>0.05	>0.05	>0.05	>0.05	>0.05
opsonic activity	r	.038	.246	(-).425	(-).156	(-).272
	p	>0.05	>0.05	>0.05	>0.05	>0.05
Age	r	.087	(-).346	.538	(-).166	.470
	p	>0.05	>0.05	<0.05	>0.05	<0.05

There is a +ve significant correlation between age and both IgA, IgD ($p < 0.05$).

TABLE (26)

Correlation between serum C_3, CIC, opsonizing effects of serum and age in KWA group.

KWA n = 21		C_3	CIC	Opsonic activity	Age
C_3	r	1.000			
	p	-			
CIC	r	(-).109	1.000		
	p	>0.05	-		
Opsonic activity	r	(-).274	(-).251	1.000	
	p	>0.05	>0.05	-	
Age	r	(-).072	.016	(-).340	1.000
	p	>0.05	>0.05	>0.05	-

No significant correlation present.

TABLE (27)

Correlation between tetanus and measles immunization, their serum antibody levels and age in KWA group.

KWA n= 21		Age	Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
Age	r	1.000				
	p	-				
Tet.	r	.452	1.000			
imm.	p	< 0.05	-			
Tet.	r	.407	.169	1.000		
ab.	p	> 0.05	> 0.05	-		
Measl.	r	.703	.400	.040	1.00	
imm.	p	<0.01	>0.05	>0.05	-	
Measl.	r	.475	.221	.419	.415	1.000
ab.	p	<0.05	>0.05	>0.05	>0.05	-

There is a significant +ve correlation between age and tetanus and measles immunization (p= <0.05, <0.01 respectively) and between age and measles antibody level (p < 0.05).

TABLE (28)

Correlation between tetanus and measles immunization and their serum antibody levels and serum immunogolobulins in KWA group.

KWA n= 21		Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
IgG	r	.103	.311	.238	(-).021
	p	>0.05	>0.05	>0.05	>0.05
IgM	r	.057	(-).394	.004	(-).527
	p	> 0.05	> 0.05	> 0.05	< 0.05
IgA	r	.176	(-).001	.453	(-).013
	p	> 0.05	> 0.05	< 0.05	> 0.05
IgE	r	(-).283	(-).225	.052	(-).187
	p	> 0.05	> 0.05	> 0.05	> 0.05
IgD	r	.255	.010	.589	.064
	p	> 0.05	> 0.05	< 0.05	> 0.05

There is a significant +ve correlation between measles immunization and both IgA, IgD ($p = <0.05$) and a -ve correlation between IgM and measles antibody level ($p<0.05$).

TABLE (29)

Correlation between serum C_3, CIC, and opsonizing activity of serum and tetanus and measles immunization and their serum antibody levels in KWA group

KWA n=21		Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
C_3	r	.081	.141	.100	.059
	p	> 0.05	> 0.05	> 0.05	> 0.05
CIC	r	(-).353	(-).014	.249	.391
	p	> 0.05	> 0.05	> 0.05	> 0.05
Opsonic activity	r	.142	.013	(-).186	(-).389
	p	> 0.05	> 0.05	> 0.05	> 0.05

No significant correlation present.

TABLE (30)

Correlation between infection and tetanus & measles immunization, their serum antibody levels and age in KWA group.

KWA n= 21		Age	Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
Infection	r	(-).073	.234	(-).335	.138	(-).213
	p	>0.05	>0.05	>0.05	>0.05	>0.05

No significant correlation present.

TABLE (31)

Correlation between infection and serum immunoglobulins in KWA group.

KWA n= 21		IgG	IgM	IgA	IgE	IgD
Infection	r	.106	.584	.372	.417	.220
	p	>0.05	<0.05	>0.05	>0.05	>0.05

There is +ve significant correlation between infection and IgM ($p < 0.05$).

TABLE (32)

Correlation between serum C_3, CIC, and opsonizing effect of serum and infection in KWA group.

KWA n= 21		C_3	CIC	Opsonic activity
Infection	r	.245	(-).079	(-).015
	p	>0.05	>0.05	>0.05

No significant correlation present.

TABLE (33)

Correlation between serum immunoglobulins in M.KWA group.

M. KWA n = 17		IgG	IgM	IgA	IgE	IgD
IgG	r	1.000				
	p	-				
IgM	r	.394	1.000			
	p	>0.05	-			
IgA	r	.450	.403	1.000		
	p	>0.05	>0.05	-		
IgE	r	.369	.269	.451	1.000	
	p	>0.05	>0.05	>0.05	-	
IgD	r	.398	.393	.360	.147	1.000
	p	>0.05	>0.05	>0.05	>0.05	-

There is no significant correlation present.

TABLE (34)

Correlation between serum immunoglobulins, age, C_3, CIC and opsonizing effects of serum in M.KWA group.

M.KWA n = 17		IgG	IgM	IgA	IgE	IgD
C_3	r	(-).302	.098	.026	(-).440	(-).337
	p	>0.05	>0.05	>0.05	>0.05	>0.05
CIC	r	.120	(-).200	.044	.332	.292
	p	>0.05	>0.05	>0.05	>0.05	>0.05
Opsonic activity	r	(-).274	.018	.018	(-).008	(-).273
	p	>0.05	>0.05	>0.05	>0.05	>0.05
Age	r	.094	(-).050	.306	.249	(-).291
	p	>0.05	>0.05	>0.05	>0.05	>0.05

There is no significant correlation present.

TABLE (35)

Correlation between serum C_3, CIC, opsonizing effects of serum and age in M.KWA group.

M. KWA n = 17		C_3	CIC	Opsonic activity	Age
C_3	r	1.000			
	p	-			
CIC	r	(-).753	1.000		
	p	<0.01	-		
Opsonic activity	r	.274	(-).364	1.000	
	p	>0.05	>0.05	-	
Age	r	.167	(-).037	.444	1.000
	p	>0.05	>0.05	>0.05	-

There is a -ve significant correlation between CIC and C_3 ($p<0.01$).

TABLE (36)

Correlation between tetanus and measles immunization, their serum antibody levels and age in M.KWA group.

M.KWA n= 17		Age	Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
Age	r	1.000				
	p	-				
Tet. imm.	r	.500	1.000			
	p	< 0.05	-			
Tet. antib.	r	.407	.336	1.000		
	p	> 0.05	> 0.05	-		
Measl. imm.	r	.773	.771	.442	1.000	
	p	< 0.05	< 0.05	> 0.05	-	
Measl. antib.	r	.166	.157	.339	.241	1.000
	p	> 0.05	> 0.05	> 0.05	> 0.05	-

There is a significant +ve correlation between age and tetanus and measles immunization ($p<0.05$) and between tetanus and measles immunization ($p<0.05$).

TABLE (37)

Correlation between tetanus and measles immunization and their serum antibody levels and serum immunoglobulins in M.KWA group.

M.KWA n=17		Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
IgG	r	(-).050	.306	.249	(-).291
	p	> 0.05	> 0.05	> 0.05	> 0.05
IgM	r	(-).375	.030	(-).074	(-).352
	p	> 0.05	> 0.05	> 0.05	> 0.05
IgA	r	.139	.435	.389	.246
	p	> 0.05	> 0.05	> 0.05	> 0.05
IgE	r	.076	.541	.266	.145
	p	> 0.05	< 0.05	> 0.05	> 0.05
IgD	r	(-).235	.260	(-).096	.056
	p	> 0.05	> 0.05	> 0.05	> 0.05

There is a significant +ve correlation between IgE and tetanus antibodies ($p < 0.05$).

TABLE (38)

Correlation between serum C_3, CIC, and opsonizing activity of serum and tetanus and measles immunization and their serum antibody levels in **M.KWA group.**

M. KWA n = 17		**Tet. imm.**	**Tet. ab.**	**Measles imm.**	**Measles ab.**
C_3	r	(-).097	(-).244	.018	(-).132
	p	> 0.05	> 0.05	> 0.05	> 0.05
CIC	r	.208	.475	.075	.324
	p	> 0.05	> 0.05	> 0.05	> 0.05
Opsonic activity	r	.285	.228	.222	.142
	p	> 0.05	> 0.05	> 0.05	> 0.05

No sig. correlation present.

TABLE (39)

Correlation between infection and tetanus and measles immunization and their serum antibody levels and age in M.KWA group.

M.KWA n= 17		Age	Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
Infection	r	.015	(-).426	(-).098	(-).408	(-).340
	p	> 0.05	> 0.05	> 0.05	> 0.05	> 0.05

No significant correlation present.

TABLE (40)

Correlation between infection and serum immunoglobulins in M.KWA group.

M. KWA n= 17		IgG	IgM	IgA	IgE	IgD
Infection	r	.072	.527	(-).339	.017	(-) .008
	p	>0.05	<0.05	>0.05	>0.05	>0.05

There is +ve significant correlation between infection and IgM ($p < 0.05$).

TABLE (41)

Correlation between serum C_3, CIC, and opsonizing effect of serum and infection in MKWA group.

M. KWA n= 17		C_3	CIC	Opsonic activity
Infection	r	(-).012	(-).079	.145
	p	> 0.05	> 0.05	>0.05

No significant correlation present.

TABLE (42)

Correlation between serum immunoglobulins in marasmus group.

Marasmus n = 29		IgG	IgM	IgA	IgE	IgD
IgG	r	1.000				
	p	-				
IgM	r	.320	1.000			
	p	>0.05	-			
IgA	r	.479	.289	1.000		
	p	<0.05	>0.05	-		
IgE	r	(-).081	.032	(-).005	1.000	
	p	>0.05	>0.05	>0.05	-	
IgD	r	.336	.269	.503	.076	1.000
	p	>0.05	>0.05	<0.05	>0.05	-

There is a significant positive correlation between IgA and IgG, and between IgA and IgD ($p<0.05$ in both).

TABLE (43)

Correlation between serum immunoglobulins, age, C_3, CIC, and opsonizing activity of serum in marasmus group.

Marasmus n = 29		IgG	IgM	IgA	IgE	IgD
C_3	r	(-).139	(-).049	(-).374	(-).058	(-).335
	p	>0.05	>0.05	<0.05	>0.05	>0.05
CIC	r	.050	(-).152	.035	.050	.084
	p	>0.05	>0.05	>0.05	>0.05	>0.05
Opsonic activity	r	.076	.270	.165	(-).097	(-).070
	p	>0.05	>0.05	>0.05	>0.05	>0.05
Age	r	.083	(-).078	.175	(-).215	(-).003
	p	>0.05	>0.05	>0.05	>0.05	>0.05

There is a significant -ve correlation between C_3 and IgA ($p<0.05$).

TABLE (44)

Correlation between serum C_3, CIC, opsonizing effect of serum and age in marasmus group.

Marasmus n = 29		C_3	CIC	Opsonic activity	Age
C_3	r	1.000			
	p	-			
CIC	r	(-).332	1.000		
	p	>0.05	-		
Opsonic activity	r	.238	(-).443	1.000	
	p	>0.05	<0.05	-	
Age	r	(-).418	.462	(-).135	1.000
	p	<0.05	<0.05	>0.05	-

There is a -ve significant correlation between CIC and opsonization ($p<0.05$), age and C_3 ($p<0.05$) and significant +ve correlation between CIC and age.

TABLE (45)

Correlation between tetanus, measles immunization their serum antibody levels and age in marasmus group.

Marasmus n= 29		Age	Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
Age	r	1.000				
	p	-				
Tet. imm.	r	.118	1.000			
	p	> 0.05	-			
Tet. antib.	r	.069	.272	1.000		
	p	> 0.05	> 0.05	-		
Measl. imm.	r	.468	.409	.308	1.000	
	p	< 0.05	< 0.05	> 0.05	-	
Measl. antib.	r	.471	.149	.268	.444	1.000
	p	< 0.05	> 0.05	> 0.05	< 0.05	-

There is a positive significant correlation between:

- Age and measles immunization and its antibodies ($p < 0.05$).
- Measles immunization and tetanus immunization ($p < 0.05$).
- Measles immunization and its antibody levels ($p < 0.05$).

TABLE (46)

Correlation between tetanus and measles immunization and their serum antibody levels and serum immunoglobulins in marasmus group.

Mar. n = 29		Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
IgG	r	.289	.163	.016	.329
	p	> 0.05	> 0.05	> 0.05	> 0.05
IgM	r	.215	.039	.121	.021
	p	> 0.05	> 0.05	> 0.05	> 0.05
IgA	r	.189	(-).051	.073	.483
	p	> 0.05	> 0.05	> 0.05	< 0.05
IgE	r	(-).090	(-).138	(-).086	(-).065
	p	> 0.05	> 0.05	> 0.05	> 0.05
IgD	r	.209	.167	.161	.391
	p	> 0.05	> 0.05	> 0.05	< 0.05

There is a significant +ve correlation between measles antibodies and both IgA and IgD ($p<0.05$).

TABLE (47)

Correlation between serum C_3, CIC and opsonizing activity of serum and tetanus, measles immunization and their serum antibody levels in marasmus groups.

Marasmus n= 29		Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
C_3	r	(-).382	(-).227	(-).455	(-).620
	p	< 0.05	> 0.05	< 0.05	< 0.05
CIC	r	.001	.179	.270	.629
	p	> 0.05	> 0.05	> 0.05	< 0.01
Opsonic activity	r	(-).293	.130	.173	(-).045
	p	> 0.05	> 0.05	> 0.05	> 0.05

There is a negative significant correlation between C_3 and tetanus immunization, measles immunization and its antibodies (p= < 0.05, < 0.05, < 0.05) and a positive significant correlation between CIC and measles antibodies (p < 0.01).

TABLE (48)

Correlation between infection, tetanus and measles immunization and their serum antibody levels and age in marasmus group.

Marasmus n= 29		Age	Tet. imm.	Tet. ab.	Measles imm.	Measles ab.
Infection	r	(-).244	(-).223	(-).334	(-).118	(-).249
	p	> 0.05	> 0.05	> 0.05	> 0.05	> 0.05

No significant correlation present.

TABLE (49)

Correlation between infection and serum immunoglobulins in marasmus group.

Marasmus n= 29		IgG	IgM	IgA	IgE	IgD
Infection	r	(-).025	.291	(-).144	.410	.046
	p	>0.05	>0.05	>0.05	<0.05	>0.05

There is +ve significant correlation between infection and IgE ($p < 0.05$).

TABLE (50)

Correlation between serum C_3, CIC and opsonizing effect of serum and infection in marasmus group.

Marasmus n= 29		C_3	CIC	Opsonic activity
Infection	r	.219	(-).106	(-).005
	p	>0.05	>0.05	>0.05

No significant correlation present.

TABLE (51)

Serum immunoglobulins in different types of infections associated with PCM compared to control group.

Variable Infection		IgG (mg/dl)	IgM (mg/dl)	IgA (mg/dl)	IgE (ng/dl)	IgD (u/ml)
Upper respiratory n = 4	$\bar{X}$	1288	152	127	45	38
	Sd	228	33	57	24	25
	p	> 0.05	> 0.05	> 0.05	> 0.05	> 0.05
Lower respiratory n = 7	$\bar{X}$	1492	167	151	85	55
	Sd	650	24	56	66	36
	p	> 0.05	< 0.001	> 0.05	< 0.05	< 0.05
Mixed infection n = 13	$\bar{X}$	1396	160	148	61	54
	Sd	440	24	65	42	64
	p	> 0.05	< 0.001	> 0.05	> 0.05	< 0.05
Gastro-intestinal n = 6	$\bar{X}$	1409	131	167	47	52
	Sd	528	23	58	36	41
	p	> 0.05	> 0.05	< 0.05	> 0.05	< 0.05
Control n = 21	$\bar{X}$	1514	124	117	40	23
	Sd	404	25	68	38	28

IgM is significantly elevated in lower respiratory and mixed infections.

IgA is elevated significantly in gastrointestinal infections

IgE is elevated significantly in lower respiratory infection

IgD is elevated significantly in lower respiratory, mixed and gastrointestinal infections.

TABLE (52)

Serum C_3 and CIC and opsonic activity of serum in different types of infection associated with PCM compared to control group.

Variable / Infection		C_3 (mg/dl)	CIC (ng/ml)	Opsonic activity
Upper respiratory n = 4	$\bar{X}$	74	2.43	1.43
	Sd	22	0.71	0.2
	p	< 0.05	< 0.05	> 0.05
Lower respiratory n = 7	$\bar{X}$	59	2.04	1.53
	Sd	34	0.46	0.23
	p	< 0.001	> 0.05	> 0.05
Mixed infection n = 13	$\bar{X}$	77	2.09	1.49
	Sd	36	0.37	0.21
	p	< 0.05	< 0.05	> 0.05
Gastro-intestinal n = 6	$\bar{X}$	55	1.96	1.45
	Sd	24	0.5	0.24
	p	< 0.001	> 0.05	> 0.05
Control n = 21	$\bar{X}$	103	1.79	1.59
	Sd	24	0.42	0.15

C_3 is depressed significantly, in all groups .
CIC is elevated significantly in upper respiratory and mixed infections.

TABLE (53)

Serum tetanus and measles antibodies in different types of infections associated with PCM compared to control group.

Variable / Infection		Tetanus antibodies (Lf unit/ml)	Measles antibodies (measliza units)
Upper respiratory n = 4	$\bar{X}$	15	0.28
	Sd	19	0.33
	p	> 0.05	> 0.05
Lower respiratory n = 7	$\bar{X}$	18	0.18
	Sd	31	0.34
	p	> 0.05	> 0.05
Mixed infection n = 13	$\bar{X}$	11	0.07
	Sd	34	0.14
	p	> 0.05	< 0.001
Gastro-intestinal n = 6	$\bar{X}$	33	0.27
	Sd	46	0.29
	p	> 0.05	> 0.05
Control n = 21	$\bar{X}$	31	0.37
	Sd	59	0.30

Measles antibodies are depressed significantly in cases with mixed infection.