

## ISOLATION OF *UREAPLASMA UREALYTICUM* IN NEWBORN INFANTS WITH RESPIRATORY DISTRESS

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### ABSTRACT

*The study was carried out in the neonatal care units (NCU) of Basrah Maternity & Children Hospital from the 1<sup>st</sup> of May to 9<sup>th</sup> of September 2003. Eighty newborn infants having respiratory distress & one hundred normal newborn infants as control group were included in this study. Information including age, sex, gestational age, mode of delivery, birth weight and signs of respiratory distress were recorded for each neonate. Throat swabs were taken from the patients and the control group and cultured on special media for each baby included in the study. Among the neonates with respiratory distress, *Ureaplasma urealyticum* was isolated from twenty two males (40.7%) out of fifty four males and fourteen females (53.8%) out of twenty six females included in the study. *Ureaplasma urealyticum* was isolated in (46.6%) of newborn babies whom gestational age was less than 37 weeks and in (42.8%) of newborn babies whom gestational age was more than or equals to 37 weeks. The study also found that neonates with birth weight less than or equal to 1500grams are liable to infection with *Ureaplasma urealyticum* more than babies with birth weight more than 1500 grams and a high percentage of isolation (66.7%) was recorded in patients with signs of severe respiratory distress. It can be concluded from this study that *U. urealyticum* can be isolated more from neonates admitted to NCU because of respiratory distress than normal neonates particularly in the very low birth weight newborns, but the real role of this organism as an etiological cause of pneumonitis needs further studies.*

### INTRODUCTION

*Ureaplasma urealyticum* may be found through out the lower urogenital tract of asymptomatic women, and is detected in the vagina of 40-80% of sexually mature women<sup>[1]</sup>. *U. urealyticum* is isolated from amniotic fluid in the presence of intact membranes as early as 12-20 weeks of gestation<sup>[2]</sup>, and can be acquired in utero either by ascending route secondary to colonization of the mother's genital tract or transplacentally from the mother's blood. *U. urealyticum* can be recovered from up to 50% of infants <34 weeks gestational age. However, the role of the organism in causing severe respiratory insufficiency remains controversial<sup>[2]</sup>. Early studies demonstrated infants weighing <1000gm who had *U. urealyticum* isolated from tracheal aspirate within 24hr. of life were twice as likely to die or develop chronic lung disease compared with uninfected newborns of similar birth weight or those weighing >1000gm. Thus, although it is clear that a high percentage of premature infants are colonized with *U. urealyticum*, the pathogenicity of *U. urealyticum* in premature infants awaits further study<sup>[2]</sup>. Therefore this study was conducted to know the frequency of *Ureaplasma urealyticum* infection in newborn babies with respiratory

distress & to identify which babies are more liable to acquire this organism.

### PATIENTS AND METHODS

Eighty newborn infants admitted to the 1<sup>st</sup> & 2<sup>nd</sup> NCU in Basrah Maternity & Children Hospital with age ranged from 0-4 days were included in the study. The study was carried out between 1<sup>st</sup> of May till the 9<sup>th</sup> of September 2003. These 80 patients were admitted because of respiratory distress. Information including age of patient, sex, gestational age, mode of delivery, birth weight, signs of respiratory distress (tachypnoea, grunting respiration & intercostal recession) & signs of severe illness or sepsis (lethargy, severe chest indrawing & cyanosis) were recorded, in addition to chest x-ray findings. The control group (100 newborn babies) included normal healthy babies randomly selected from delivery room, operation theaters (caesarian section) & newborn babies attending the out patient clinics for checking, these babies have neither signs of respiratory distress nor sepsis. Throat swabs were taken from all the 180 babies (by the same person) for isolation of *U. urealyticum*. The swabs were placed in transport media followed by inoculation. Isolation and identification of *U. urealyticum* was performed by the monophasic-diphasic culture set up (MDCS) which is

superior culture technique for the isolation and identification of Mycoplasma<sup>[3]</sup>.

**The MDCS consists of**

1. *Liquid media composed of: PPLO broth, horse serum, yeast extract, thallium acetate, penicillin, glucose, phenol red and methylene blue.*

2. *Solid media composed of: PPLO agar, horse serum, yeast extract, thallium acetate, penicillin, glucose, methylene blue, DWA, K<sub>2</sub>HPO<sub>4</sub>.*

*Positive Ureaplasma isolation was ascertained when changing in color of liquid phase after 24 hours occurs.*

*However, isolated colonies became apparent on the upper portion of the slant after 96 hours.*

**Statistical Analysis**

*The data obtained from the above patients & control group were analyzed using Z-test. P-Value less than 0.05 was regarded as significant.*

**RESULTS**

This study included 180 neonates: 80 neonates with respiratory distress and 100 healthy neonates as a control group. The criteria of patients & control group of this study are illustrated in (Table-1).

*Ureaplasma urealyticum* was detected from the two groups in 36(45%) neonates with respiratory distress and 3(3%) healthy neonates respectively. (Table-2), the difference in

positivity between the two groups of neonates was highly significant (P<0.01).

Out of 80 patients, 54 were males & 26 were females, of the 54 males, 22(46.7%) had positive culture for *U. urealyticum* & out of the 26 females, 14(53.8%) had positive culture, & this difference is statistically not significant (P>0.05) as shown in (Table-2). On the other hand, 21 patients (46.6%) of a total of 45 patients whose gestational ages were less than 37 weeks had positive culture, while 15 patients (42.5%) of a total 35 patients whose gestational ages were more than or equals to 37 weeks had positive culture, this difference is also statistically not significant (P>0.05), (Table-3).

Ten patients (71.4%) of total 14 patients whose weights were ≤1500gm had positive cultures for *U. urealyticum*, while 26 patients (39.4%) of a total 66 patients whose weights were > 1500gm had positive cultures, this difference is statistically significant (P<0.05), (Table-4).

Eighteen patients (66.7%) of a total 27 patients who had signs of severe illness and respiratory distress had positive cultures for *U. urealyticum*, while only 18 patients (34%) of a total 53 patients with signs of less severe respiratory distress had positive cultures, & this difference is statistically, significant (P<0.05), (Table-5).

**Table 1. Selected criteria of neonates included in the study.**

Criteria	Patients			Control		
	No.	%	Total No.	No.	%	Total No.
Sex	Male	54	67.5	80	60	100
	Female	26	32.5	-	40	40
Gestational age/ week	< 37	45	56.25	80	42	100
	≥ 37	35	43.75	-	58	-
Birth weight/gm	≤1500	14	17.5	80	0	100
	> 1500	66	82.5	-	100	100

**Table 2. Distribution of U. urealyticum culture positive neonates in relation to sex.**

Sex	Patients*			Control		
	Total	Positive culture		Total	Positive culture	
		No.	%		No.	%
Male	54	22	46.7	60	2	3.3

Female	26	14	53.8	40	1	2.5
Total	80	36	45	100	3	3

\*Z-test = 0.87 (P>0.05)

**Table 3.** Distribution of *U. urealyticum* culture positive neonates in relation to gestational age.

Gestational age / week	Patients*			Control		
	Total	Positive culture		Total	Positive culture	
		No.	%		No.	%
< 37	45	21	46.6	42	2	4.7
≥ 37	35	15	42.5	58	1	1.7
Total	80	36	45	100	3	3

\*Z- test = 0.34 (P> 0.05)

**Table 4.** Distribution of *U. urealyticum* culture positive neonates in relation to birth weight.

Birth weight/gm	Patients*			Control		
	Total	Positive culture		Total	Positive culture	
		No.	%		No.	%
≤ 1500	14	10	71.4	0	-	
> 1500	66	26	39.4	100	3	3
Total	80	36	45	100	3	3

\*Z-test = 2.19 (P< 0.05)

**Table 5.** Distribution of *U. urealyticum* culture positive neonates in relation to severity of respiratory distress.

Signs of respiratory distress	Total No.	Positive culture	
		No.	%
Severe illness	27	18	66.7
Moderate respiratory distress	53	18	34
Total	80	36	45

Z-test = 2.77 (P< 0.05)

**DISCUSSION**

Respiratory infection is one of the major causes of admission to NCU in hospitals. *U. urealyticum* may cause clinically inapparent chorioamnionitis resulting in an eight-fold increase in fetal death or premature delivery<sup>[2]</sup>. In this study *U. urealyticum* was isolated from neonates who were admitted to NCU because of respiratory distress. However, the study did not investigate the role of other pathogens (GBS, *E. coli* & others) in causing respiratory infections, or other causes of respiratory distress e.g. hyaline membrane disease. It was found that neonates of very low birth weights (weight is <1500gms) who are mostly extremely premature are of great risk to acquire this organism, this is in agreement with other studies Ferre et al, Prajs et al, Sethi et al, Waites et al, and Taylor-Robinson<sup>[4-8]</sup>. These studies found

that the majority of neonates with respiratory distress and acquired *U. Urealyticum* from infected mothers are of body weights less than 1500 grams. The study has also identified that *U. urealyticum* is isolated in a higher percentage from neonates with severe illness & severe respiratory distress. From this study it is clear that *U. urealyticum* can be isolated from neonates admitted to NCU because of respiratory distress, but the real role of this organism as an etiological cause of pneumonitis in the neonatal period is not well identified. Thus, identification & treatment of mothers who are *U. urealyticum* positive is essential & further studies are needed regarding. The role of *U.urealyticum* as an etiological cause of neonatal respiratory infections.

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