Lifestyle Changes, Bacterial Vaginosis (BV), Ureaplasma Mycoplasma (UM) Species and Adverse Pregnancy Outcome in Albanian Women

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Abstract: _Introduction_: _It was not so long ago, when presence of bacterial vaginosis in Albanian pregnant women was almost irrelevant. Species like Ureaplasma and Mycoplasma, were not in the eyes of everyday practice. Rapidly lifestyle changes have brought these infections to escalate into 51.5% in pregnant women alone. The numbers climb higher in the non-pregnant population._ _Aim_: _This study, works towards drawing a connection between lifestyle changes, bacterial vaginosis, UM species and adverse pregnancy outcome._ _Materials and Methods:_ _This is a retrospective study of pregnant women followed up over a 5 year period in our practice. After exclusion criteria were applied, the remaining group of 1482 women was carefully followed till pregnancy term. Vaginal discharge collected from the cervix was cultured with commercial kits and thereafter read for presence of bacterial load, with careful attention to BV and UM species. Detailed study of the patients charts, containing anamnesis, sonographic evaluation, laboratory results was also performed and lifestyle indicators were considered as variables for the study_ _Results_: _The overall incidence of UM species reported by this study, was 51.5%. Co-infection with other bacterial vaginosis was estimated to be 58%. The preterm rate in the infected subgroup was 5% compared to 8% of the overall preterm rate in both maternities of Tirana for the same period of time. Presence of UM (OR=3.1, 5%CI 1.8-4.5, p<0.01) and age <20 vjeç (OR=2.3 95%CI 1.9-3.4, p<0.01) were found to be indipendeble risk factors for a preterm delivery. UM infection was found to be associated with :age < 20 yo (OR= 1.9 95%CI 1.4 - 2.6, p<0.01); > 12 years of education (OR= 2.2 95%CI 1.8 - 2.8, p<0.01); first coitus at less than 18yo (OR= 2.4 95%CI 1.1 - 1.9, p<0.01): Candida albicans (OR= 8.7 95%CI 6.8 - 11, p<0.01); Menarche <12yo (OR= 1.3 95%CI 1.0 - 1.6, p<0.01); vaginal douching (OR= 2.6 95%CI 1.8 - 3.9, p<0.01): oral sex (OR= 1.9 95%CI 1.5 - 2.3, p<0.01); absorbents (OR= 2.5 95%CI 1.9 - 3.2, p<0.01. In the multivariate logistic regression UM was associated with :age < 20yo (OR= 1.9 95%CI 1.4 - 2.6, p<0.01);first coitus at less then 18 yo (OR= 2.4 95%CI 1.1 - 1.9, p<0.01); menarche <12 yo(OR= 1.3 95%CI 1.0 - 1.6, p<0.01);_ _Conclusions_ : _The presence of UM puts serios thread to the pregnancy. It's estimated a 2-3 fold higher risk for adverse pregnancy outcome, compared to women who test negative. The study proved a strong correlation of preterm rate with UM presence and a higher impact of UM when co-infection with BV existed. These findings once more draw special attention to the early identification of possible colonisation from UM species. On the other hand lifestyle changes including sexual activity at younger age, oral sex, vaginal douching and higher level of education were exposing factors to UM infection.Therefore is these doctors opinion that screening for UM should be considered part of routine protocol during pregnancy_

Keywords: ureaplasma, mycoplasma, infection, bacterial vaginosis, OR, p,statistical significance

1. Introduction

The incidence of BV in Albania has faced a rapid increase. 3 decades ago, the most frequent finding in direct microscopy was Trichomonas vaginalis, in part due to limited diagnostical technology. Even that accounted for a less than 10 % incidence of BV in pregnant women and was mostly linked to poor hygene.

We are actually dealing with numbers climbing high regarding BV and some special species such as the Molicutes which have gained recognition only lately this last decade and which are still not taken into consideration by all our colleagues. The matter has been subject to controversies in the literature in the effort to identify any possible link with lifestyle acquisition of such infection and further more the impact of UM colonization on pregnancy outcome. Any chances to predict such outcome on the other hand are utterly compelling to every obstetrician's eyes. Despite undeniable advances in perinatal care, neonatal intensive care units and the availability of medical care to most of the population, the prematurity rate remains high worldwide. This is partly because of the multifactorial ethyology of the labor process. On the other hand such infection is associated to more than 40% of preterm, whereas 85% of early preterm is due to an intro-uterine infection caused primarily by UM.

Taking all this into consideration we decided for the first time in Albania, to gather all information available in our patient's charts with the intention to identify any indicators that certain behaviours could make patients prone to acquisition of UM and that UM itself had a strong impact on pregnancy outcome, leading into preterm birth, and possible low weight of the offspring.

There is currently no available studies in Albania to make a comparison or to get orientation regarding specific features of our population. This would seem to give us the advantage, but it deprives us from any reference system. None the less, the group chosen to be studied and the multidimensional approach provided us with many answers. To this example, we took under consideration physical changes, such as menarche together with first coitus at younger age than it used to be consumed, multiple partners, rather than monogamic relationships, sexual practices like oral sex, toys and self-pleasuring techniques that are now normality, but used to be considered as perversities.

Statistical analysis was provided while analyzing lifestyle indicators, infection from UM species and pregnancy outcomes.

2. Materials and Methods

This is a retrospective study, based on multiple data gathered from patient's records during a 5 year long period. The initial group contained 1738 patients. Exclusion criteria such as:

- previous PTB
- Uterine malformations
- Uterine fibromyomas
- Systemic diseases
- Infective diseSes
- Age <18>40 yo
- Diabetes
- Hypertension
- Multiple pregnancies
- IVF

Incompetent cervix, were applied leading the final group to contain 1482 women who were followed till delivery. From the first sonographic assessment arranged with LMP the gestation age were defined between 7-40 wog. Based on the anamnestical, clinical, sonographical and lab results, we were able to highlight potential variables to be considered through the study. The UM culteres provided had been collected by doctors of this study during the vaginal exams. Patients lied in lithotomic position and a sterile, non – lubrificated speculum was pushed inside the vagine without trauma till the cervix was exposed. Sterile swabs colleted material from the endocervix and were immediately inserted into saline sterile suspension, left there to rest for a couple of minutes before the suspension was put into the commercial kit and thereafter incubated for 48 hrs. Swabs for direct microscopy and conventional cultures were also collected and vaginal pH was evaluated.

A BV, was determined using the Amsel Criteria, where presence of clue cells, Ph>4.5, positive wiff test and thin grey-green discharge were noted.

Co-contamination with GBS was taken into consideration when present. Lifestyle habits, such as use of vaginal douching, everyday absorbents, consumption of alcohol or smoking habit, together with sexual preferencies, number of partners and first coitus were seen as linked, cases in which, attention to both the rate of UM infection and preterm delivery was drawn.

3. Statistical Analysis

Socio-demographic data as well as general characteristics of the population were assessed. Variables used were binary. SPSS 19.0 software package was used for statistical analysis, where value of p, OR, CI and Kendal's tau coefficient were assessed.

4. Results

From careful anamnesis and questionnaires available from patients in years, we decided to evaluate UM infection and poor obstetrical outcome focused on the following variables:

| Variables	N	%
Urban living population	700	47.2
Rural living population	782	52.8
Mean age (SD)		
Age Years		
18 – 20	272	18.4
21 - 25	324	21.9
26 – 30	439	29.6
31 – 35	416	28.1
36 – 40	31	2.1
Parity		
Primigravidas	427	28.8
Nonprimigravidas	1055	71.2
Education level		
≤12 yrs	933	63.0
> 12 yrs	549	37.0
Smoking		
Yes	123	8.3
No	1359	91.7
Alcohol consumption		
Yes	158	10.7
No	1324	89.3

Most of the patients came from rural areas, having a significant difference from the patients living in urban areas. The predominant ages were 26-30 yo and 31-36 yo tjera (χ^2=359 p<0.01).. Most of the women were not primiparas p<0.05 and had an educational level of less then 12 yrs p<0.05. The majority had reported regular use of everyday absorbents, but not vaginal douching, whereas most of the patients had practiced and still did oral sex. Sexual toys went unaccounted in this study as few patients referred use of them, and no statistical analysis proved any special impact of them in UM acquisition or preterm itself.

Variables	N	%	95%CI	p
Menarche				
< 12yrs	519	35.0	32.6 - 37.5	<0.01
> 12yrs	963	65.0	62.5 – 67.4	
First coitus				
≤ 18 yo	266	17.9	15.9 - 19.9	<0.01
> 18 yo	1216	82.1	80.0 - 84.0	
Nr. Of partners				
≤ 3 partners	1201	81.0	71.9 - 82.9	<0.01
> 3 partners	281	19.0	17.0 - 21.0	
UTI during pregnancy				
Yes	474	32.0	29.6 - 34.4	
No	1008	68.0	65.6 - 70.0	<0.01
AB use before conception				
Yes	177	11.9	10.3 - 13.6	
No	1305	88.1	86.3 - 89.7	<0.01
Pre conception hormonal therapy				
Yes	430	29.0	26.7 - 31.4	<0.01
No	1052	71.0	68.6 - 73.2	
Vaginal douch				
Yes	148	10.0	8.5 - 11.6	<0.01
No	1334	90.0	88.3 – 91.4	
Oral sex				
Yes	874	59.0	56.5 - 61.4	<0.01
No	608	41.0	38.5 - 4 3.5	
Regular use of absorbents				
Yes	1156	78.0	75.8 - 80.0	<0.01
No	326	22.0	19.9 - 24.1	

Smoking was practised by 123 women (8.3%) (95%CI 6.9 – 9.8)
Alcohol consumption - 158 women (10.7%) (95%CI 9.1 – 12.3)

Variables	N	%	95%CI	p
UM +				
Yes	763	51.5	48.9 – 54.0	
No	719	48.5	45.9 – 51.0	<0.01
(GBS)+				
Yes	422	28.5	26.2 - 30.8	
No	1060	71.5	69.1 - 73.8	<0.01
Chlamydia +				
yes	31	2.1	1.4 - 2.9	
No	1451	97.9	97.0 - 98.6	<0.01
Candida albicans +				
Yes	696	47.0	44.4 - 49.6	
No	786	53.0	50.4 - 55.6	<0.01
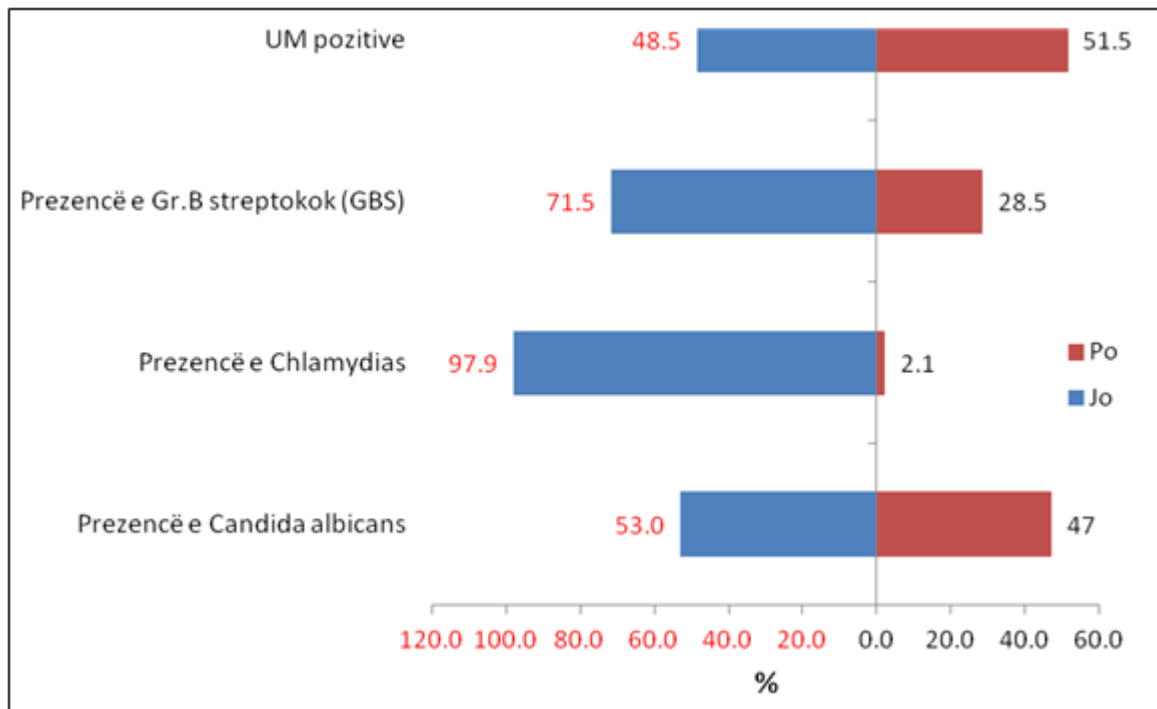
Po – YES

Jo - NO

AREAS		Urban (700)	Rural (782)	p
	n (%)	n (%)	n (%)	
UM +	161 (11)	98 (14)	63 (8)	<0.01
U+	501 (34)	303 (43)	198 (25)	<0.01
M+	101 (7)	65 (9)	36 (5)	<0.01
Total UM	763 (52)	466 (67)	297 (38)	<0.01

UM + (14%), U+ (43%), M+ (9%) and total UM+ (67%) are higher in urban rather than rural areas with significant difference p<0.01.

Co-infections	Positive n (%)	Negative n (%)	Total
Trichomonas vaginalis	151 (19.8%)	612 (80.2%)	763
Gardnerella vaginalis	294 (38.5%)	469 (61.5%)	763

Preterm	N	%	95%CI
yes	74	5.0	4.0 – 6.2
No	1408	95.0	93.7 – 96.0

5% (95%CI 71.9 - 82.9) had a preterm, while 1408 (95%) (95%CI 93.7 – 96.0) delivered in term, p<0.01. In univariate analysis of logistic regression it was identified an association between preterm and vaginal douching (OR= 2.4 95%CI 1.35 - 4.4, p<0.01) and UM+ (OR= 2.2 95%CI 1.3 – 3.6, p<0.01).

Patients positive for UM had a 3.1 fold increase in the risk of preterm compared to the group that tested negative, with significant difference between them (OR= 3.1 95%CI 1.8 – 4.5, p<0.01). Age ≤ 20 yo had a 2.3 fold increase in the risk of preterm compared to the group >20 yo, with significant difference between them (OR= 2.3 95%CI 1.91 – 3.4, p<0.01).

- From 161 patients UM +, 14 (8.7%) had preterm 95%CI 4.8-14.1;
- From 501 patients U+, 35 (7%) had preterm 95%CI 4.9-9.6;
- From 101 patients M+, 3 (3%) had preterm 95%CI 0.6-8.4;
- From 763 patients [U+ & M+ & UM+] 51 (6.7%) had preterm 95%CI 5.0-8.7;
- From 151 patients [UM+ & TV+] 28 (18.5%) had preterm 95%CI 12.6-25.6;
- From 294 patients [UM+ & GV+] 34 (11.6%) had preterm 95%CI 8.2-15.8;

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Preterm is more frequent In cases of coinfection : UM+ & TV+ (18.5%)

UM+ patients have 2 fold increase risk for preterm compared to the negative group, with significant difference OR=2 95%CI 1.1 – 3.7 p=0.02

U+ patients have a 1.8 fold increased risk for preterm compared to the negative group with significant difference OR=1.8 95%CI 1.13 – 2.9 p=0.01

M+ patients had no significant difference with the negative group OR=0.6 95%CI 0.17 – 1.82 p=0.3

Totally [U+ & M+ & UM+] have a 2.1 fold increased risk for preterm compared to the negative group with significant difference OR=2.1 95%CI 1.3 – 3.6 p<0.01

UM + & TV+ co-infection has a 5.8 fold increased risk for preterm compared to the negative group OR=5.8 95%CI 3.2 – 10.4, p<0.01

UM + & GV+co-infection has a 3.5 fold increased risk for preterm compared to the negative group with significant difference OR=3.5 95%CI 1.9 – 6.3, p<0.01

UM+ total, [UM + & TV+], [UM + & GV+] are independent risk factors for preterm delivery (p<0.05).

5. Conclusions

Lifestyle changes, acquisition of new habits, new trends, impose to medicine a multidimensional approach. This is what this study showed. Especially to us, who come from a certain regimen, with some "moral standards", the last decades have been a revelation. Young women and men engage earlier in sexual intercorse, have a tendency to experiment, have different routines and habits from what they used to, and therefore are often prone to develope "special conditions" and acquire genital infections which at times persist. Pregnancy offcorse, imposes greater risk and it is indeed our area of expertise. Preterm is worldwide a problem under obstetritians and neonatologist focus. It is estimated that almost 1 in 9 babies are born premature in the US and numbers are even higher in developing countries. The neonatal ICU, is very expensive and often it cannot do enough.

This study is subject to major controversies, and even in Albania, not all collegues agree to wether screen for UM and BV during pregnancy or not. From the results mentioned above, it is clear the significant impact proved by statistical analysis of how these infections contribute to poor obstetrical outcome.

Therefore, it is these doctors opinion and strong recommandation that screening should be part of routine protocols throughout the pregnancy in order to identify wich patients are in the red zone, and provide them with special treatment,which we lacked to describe in this study, but will show in the studies to come.

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