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Content **Page**

DENGUE CRISIS IN BANGLADESH: VACCINE AS A HOPE

Zafor Sadeque

The battle against dengue fever in Bangladesh has been ongoing struggle, characterized by sporadic outbreaks since 1964. The year 2000 marked a point when a turning large epidemic outbreak thrust the disease into the spotlight[1] Subsequently, varying intensities of dengue activity were observed each year until 2018. However in 2019, Bangladesh faced the largest dengue epidemic in its history, with 101354 reported cases and 164 dengue related deaths[2]. This outbreak reached regions previously considered dengue-free, raising concerns about its expanding reach from 2019 to 2022 Bangladesh recorded staggering 192,277 dengue cases and 541 lives lost. However, the 2023 alone has been a sobering wake-up call, with 264,062 confirmed cases and 1317 deaths[3]. It is widely believed that. These numbers are under reported, as only a fraction of dengue cases result in official diagnoses. In fact, for every symptomatic case reported three more remain hidden beneath the surface making. These numbers merely the tip of iceberg. The consequences of this epidemic extend far beyond the immediate health impact. The financial burden on families and the healthcare system is immense[4].

In controlling the dengue epidemic, we can draw inspiration from the Swiss cheese model a concept from public health. It illustrates that preventing a complex problem like dengue requires multiple layers of defense, much like the slices of swiss cheese. when these layers align, they form a solid defense, but sometimes holes, failures occurs. To achieve effective dengue control, we must act on various fronts simultaneously mosquito control, public awareness campaigns, community engagement and most notably vaccination.

Dengue vaccines such as:

1. Dengvaxia (CYD-TDV) - Sanofi pesteur.

Type-live attenuated tetravalent vaccine (targets all 4 denque virus. Serotypes).

Approved in 2015 by WHO; licensed in over 20 countries.

Age group 9-45 years

Effectiveness:

65% overall efficacy.

Best protection in people previously

Infected with dengue increased risk of severe dengue in people without prior exposure

Here requires pre-vaccination screening.

Availability in Bangladesh: Not yet widely implemented due to cost, logistic of screening and WHO Caution.

2. Qdenga (TAK-003)-Takeda.

Type-Live attenuated vaccine (derived from DENV-2).

Approved in 2022-2023 in EU, UK, indonesia, Brazil and others.

Age Group 4-60 years.

Effectiveness:

30% overall efficacy after 1 year.

Effective in both seropositive and seronegative individuals.

No need for pre-vaccination screening.

Dose: 2 doses (3 months apart)

Bangladesh: not yet introduced, but highly relavent for future inclusion.

key Barriers:

No dengue vaccine is officialy part of Bangladesh national immunization program because of cost of vaccine.

Requirement of screening (for Dengvaxia) infrastructure needed for Cold Chain and mass roll out.

Surveillance system for serotype distribution still under development.

WHO Currently recommends vaccine only in areas with in high seroprevalence (>70%) among 9-16 years-olds.

As we confront the ongoing dengue epidemic in Bangladesh, the development and distribution of dengue vaccines are a ray of hope. these vaccines can transform the landscape of dengue control, saving lives, alleviating sufferings and reducing the socioeconomic burden on our nation.

References:

1. Kayesh MEH, Khalil 1, Kohara M, Trokiyama-Kohra k. inceasing Dengue Burden and severe dengue Risk in Bangladesh: An overview, Topical medicine and infectious disease 2023 Jan,8(1):32
2. Dengue-Bangladesh [internet]. [cited 2023 Oct 23) Available from: https//www.who.intemergencies/disease-outbreak-news/item/2022 DON 424.
3. Dengue-Status Report (DGHS) [internet) [cited 2023 oct 28] available from: https//olddghs.govt.bd/index.php/bd/home/5200 daily-dengue Status report.
4. Epidemiological and Economic Burden of Dengue in Dhaka in 2019, Bangladesh [internet]. [cited 2023 oct 28] Available from: https//bids.org.bd/pete/reserches/?rid=222

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COMPARATIVE STUDY OF EFFICACY AND SAFETY OF ADAPALENE GEL AND BENZOYL PEROXIDE GEL IN THE TREATMENT OF MILD TO MODERATE ACNE VULGARIS

Md. Abul Kalam[1], Md Kamrul Islam[2], Md Shah Zaman[3]

ABSTRACT

Background: Acne is a common dermatological disorder of teen age group. There are different modalities of topical and systemic treatments are available to manage this disease. **Objective:** To evaluate the efficacy and safety of Adapalene 0.1% gel in comparison to Benzoyl Peroxide (BPO) 2.5% gel for the treatment of mild to moderate acne vulgaris. **Methods:** This study, a parallel-group, randomized open clinical trial was carried out for a period of 12 months. Total sixty patients of mild to moderate Acne were randomly enrolled into two equal groups (group A and B). Group-A were treated with Adapalene 0.1% gel for 12 weeks, and group-B were treated with BPO 2.5% gel for 12 weeks. Evaluation was done by following, the success rate (subjects ‘‘clear’’ or ‘‘almost clear’’), counting skin lesions, seeing the cutaneous tolerability, and adverse events. **Results:** Adapalene 0.1% gel was significantly more effective than BPO 2.5% gel, with significant differences in total lesion counts observed as early as 4 weeks of treatment. Adverse event frequency and cutaneous tolerability profile was significantly favorable for adapalene gel in the treatment of acne vulgaris. **Conclusions:** Once daily Adapalene gel provides significantly greater efficacy and safety for the treatment of mild to moderate acne vulgaris compare to Benzoyl Peroxide gel.

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Introduction

Acne vulgaris is a chronic disease of the pilosebaceous unit. Usually occur at puberty but can also be seen in adult age. A multifactorial pathophysiology including sebaceous gland hyperplasia with seborrhea, altered follicular growth and differentiation, Propionibacterium acnes proliferation, and inflammation[1]. Most cases of acne consist of comedones, papules,

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pustules, and nodules. Although the course of acne may be self-limiting, but sometime pitted or hypertrophic scar may persist for lifelong[2]. Lesions of acne vulgaris can be divided into four grades–1, 2, 3, and 4. Grade 1 consists of comedones and occasional papules. Grade 2 consists of papules, comedones and few pustules. Grade 3 consists of predominant pustules, nodules, and abscesses. Grade 4 consists of mainly cysts, abscesses, and widespread scarring [3]. Drugs used for Grades 1 and 2 (mild-to-moderate case) of acne vulgaris are topical comedolytics, antibacterials, and retinoids as monotherapy or combination therapy. Grades 3 and 4 (severe cases) of acne vulgaris require systemic antibacterials along with topical agents[2]. Topical treatments such as adapalene and benzoyl peroxide are popular in mild to moderate acne vulgaris[4]. Benzoyl peroxide is a potent topical antibacterial agent, acts through oxidation and formation of free radicals causing a reduction of P. acnes. It also has comedolytic property and mild anti-inflammatory actions. It is usually used alone or in combination with other topical anti-acne medications[3]. Adapalene is a topical retinoid. It is a receptor-selective naphthoic acid derivative with anti-inflammatory, comedolytic, and anti-comedogenic properties[5]. It is recognized as an effective topical retinoid with a favorable tolerability profile and is therefore a rational selection for acne treatment in alone or combination with an antimicrobial agent[6].

This study is planned to compare the efficacy and side effects of topical application of Adapalene alone and BPO alone in the treatment of mild to moderate acne vulgaris.

Materials and methods

This randomized open clinical study was carried out in the department of dermatology and venereology of Tairunnesa memorial medical college Hospital, Tongi. Gazipur, Bangladesh from October, 2023 to April, 2024.(total period of 6 month). Total 60 patients of clinically diagnosed acne vulgaris was taken. Data were collected in the structured questionnaire and informed written consent was taken from all selected patient. Patients between 15 and 29 years of age with mild to moderate facial acne vulgaris, assessed using the Investigator Global Assessment Scale with a minimum of 10 inflammatory lesions, 10 to 100 non-inflammatory lesions, and no more than one nodule or cyst on the face, were included in this study. Exclusion criteria were: patients suffering from nodulo-cystic acne, pregnant women and lactating mother, patient taking any medication for acne, persons having hypersensitivity to adapalene and benzoyl peroxide and patients with other dermatologic conditions interfering with the treatment of acne vulgaris.

A total number of sixty patients were primarily selected and randomly divided into two equal group (group-A and group-B). Group A was given adapalene 0.1% gel once daily in the evening for 12 week. Group B was given BPO 2.5% gel in the evening for same duration. Patients were clinically assessed at baseline and at week 4, 8 and 12. The primary efficacy variables were success rate (the percentage of subjects rated ‘‘clear’’ or ‘‘almost clear’’ on the investigator’s global assessment scale [IGA] of acne severity) and percentage of lesion reduction rom baseline (total, inflammatory, and

noninflammatory). Safety and tolerability were assessed through evaluations of local facial tolerability and adverse events. At each visit, the investigator rated, scaling, erythema, dryness, burning, pruritus on a scale ranging from 0 (none) to 3 (severe). Adverse events were evaluated at each visit. Data were analyzed using SPSS 16 (χ2-test and exact Fisher test). P values less than 0.05 were considered significant.

Result.

Total 60 patients were diagnosed with mild to moderate grade of acne vulgaris and fulfilled the inclusion and exclusion criteria were included in this study. Demographical distribution of patients are shown in table 1. The mean age of presentation in our study was 21.50±3.32 years. Female predominance was observed 43 (71.7%). In comparison to male 17(28.3%). Male: female ratio was 1:2.52. Majority of the patients were students 45(75%). 41 (69.3%) were unmarried and 19 (31.7%) were married. 85% patients had oily and 15% had dry skin type. Face was the common site 93.33% in all the patients, followed by back 56.7% and chest 13.33%. Most of the females had regular menstruation (67%) out of that 28.3% female had worsening of acne before menses and 7.2% had worsening of acne after menses.

Table 1. Demographic distribution of patient

Parameters	N(%)
Total patients	60
Male : Female ratio	1:2.52
Age of presentation (years) 15 - 19 20 - 24 25 - 29 Mean age	 21 (35%) 27 (45%) 12 (20%) 21.50±3.32 years
Unmarried	41 (69.3%)
Married	19 (31.7 %)
Student	45(75%)

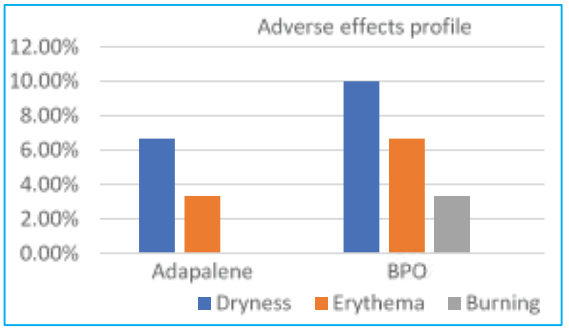
Mean score for open comedone, closed comedone, papule and pustule was identical between two groups at base line ($p>0.05$). Significantly better reduction of acne score for open comedone, closed comedone, papule, pustule and total acne score was noticed at 2nd and 3rd follow up ($p<0.005$) in the group A than the group B. Percent reduction of acne severity from base line to final follow up was 94.76% in group A and 83.42% in group B and it was statistically significant between two group ($p=0.001$); table 2.

Table -2. Efficacy of treatment

Follow up	Group A (Adapalene) (mean lesions count)	Group B (BPO) (mean lesions count)	p-value
Baseline (0 week)	34.66±6.40	33.66±4.96	0.45
4th week	31.56±3.86	24.0±3.27	0.188
8th week	11.10±2.22	15.26±3.04	<0.001
12th week	2.66±1.17	6.30±1.58	<0.001
Reduction from baseline To 3rd follow up	93.66%	82.32%	<0.001

According to our study, application of adapalene 0.1% gel also showed a better safety profile than benzoyl peroxide. After 12 week of treatment, in Group-A 6.6% patient had dryness of skin and 3.3% had erythema, whereas in Group -B, who had applied benzoyl peroxide, among them 10% suffered from dryness, 6.6% erythema and 3.3% burning. There was a significant difference of adverse effects between two groups($p > 0.05$) with favorable to Adapalene (Figure 1). Adverse events did not interfere with completion of treatment in the patients. So, in our study Adapalene 0.1% achieved better response than the application of 2.5% BPO gel.

Figure -1. Adverse effects at 3rd follow up.



Discussion

The incidence and severity of acne peaks at 40% in 14-17-year-old girls and at 35% in boys aged 16-19 years. Despite its spontaneous regression in most patients, acne persists in 10% of those patients over the age of 25 years[7]. For mild to moderate acne vulgaris, topical therapy is the standard treatment[8]. The retinoids and benzoyl peroxide are frequently used drugs for the topical treatment. Benzoyl peroxide is a bactericidal agent that has moderate comedolytic and anti-inflammatory action. Topical retinoids reduce the abnormal growth and development of keratinocytes within pilosebaceous duct[9] Adapalene, which is a topical retinoid, binds to specific retinoic acid nuclear receptors, and modulates the cellular differentiation, keratinization and inflammatory processes[10].

Despite the fact that there are a lot of studies with benzoyl peroxide, or adapalene alone, there are only a few studies which compare these two drugs[11-13]. Therefore our aim was to compare adapalene and benzoyl peroxide in terms of their safety and efficacy in the topical treatment of acne vulgaris.

In our study, reduction of non-inflammatory lesion, inflammatory lesion and total lesion counts from baseline values were highly significant in both the groups ($p < 0.001$) and between the groups also, there was a statistically significant difference present in different visits ($p < 0.05$). These findings conclude the better efficacy of adapalene as compared to benzoyl peroxide for the treatment of mild to moderate acne vulgaris. This data correlates with the study conducted by Babaeinejad and Fouladi, they found adapalene to be significantly more superior to benzoyl peroxide in reducing the lesions of mild acne vulgaris[5]. But they found a faster onset of action of benzoyl peroxide (at month 1) against inflammatory lesions, which they concluded to be due to its more rapid and superficial antibacterial and anti-inflammatory functions. Like our study, this study was also a single Centre, randomized study comparing efficacy and safety of adapalene 0.1% gel and benzoyl peroxide 2.5% gel for a study period of 3 calendar month5.

A similar comparative clinical study of efficacy and safety of adapalene 0.1% gel versus benzoyl peroxide 2.5% gel for the treatment of acne

vulgaris by Dubey A et al. They found that a better efficacy and safety of adapalene than benzoyl peroxide in the treatment of mild to moderate acne vulgaris[14].

In a similar study, Nascimento et al also compared the efficacy and safety of adapalene 0.1% gel and benzoyl peroxide, but the concentration of benzoyl peroxide was different, they used 4% benzoyl peroxide, and unlike our study, they found benzoyl peroxide to be more efficacious than adapalene on non-inflammatory and inflammatory lesions at weeks 2 and 5[15].

Korkut et al compared these two drug monotherapies with their combination, and concluded that the combination therapy has no superior efficacy over adapalene or benzoyl peroxide monotherapy. This was also an open-label, prospective study but unlike our study, they used 5% benzoyl peroxide lotion[16].

The adverse events are also major determinants in selecting a topical medication for acne patients. In our study, we found lesser side effects with adapalene group than those with benzoyl peroxide. The patients treated with adapalene suffered from 6.6% dryness, 3.3% erythema whereas those treated with benzoyl peroxide had 10% dryness, 6.6% erythema and 3.3% burning. The adverse events did not interfere with the completion of the treatment. Similarly a study conducted by Babaeinejad and Fouladi, mild and transient side effects were found in both adapalene and benzoyl peroxide groups[4].

It has been justified that benzoyl peroxide 2.5% is as effective as higher concentrations (5% and 10%) in treating acne vulgaris while causing fewer side effects[17]. In the study conducted by Nascimento et al, both adapalene and benzoyl peroxide were found to be safe drugs although they used 4% benzoyl peroxide[15].

In a study by Korkut et al concluded that there were no significant differences between the 3 groups (adapalene, benzoyl peroxide and adapalene-benzoyl peroxide combination) with regard to erythema, dryness or burning. All the side effects diminished with the continuation of the treatment[16].

Conclusion

From this study we concluded that Adapalene has better efficacy and safety than benzoyl peroxide, thus adapalene monotherapy can be used for the treatment of mild to moderate acne vulgaris, whereas severe inflammatory lesions of acne should be treated with combining adapalene with other drugs, along with the systemic therapy as suggested by previous studies.

References

1 Pawin H, Beylot C, Chivot M, et al. Physiopathology of acne vulgaris: recent data, new understanding of the treatments. Eur J Dermatol. 2004;14:4-12.

2. Dubey A, Amane H. Comparison of efficacy and safety of adapalene and benzoyl peroxide-clindamycin combination in the topical treatment of acne vulgaris. Int J Basic Clin Pharmacol 2016;5:1727-32.

3. Zaenglein AL, Graber EM, Thiboutot DM, Strauss JS. Acne vulgaris and acneiform eruption. In: Wolff K, Goldsmith L, Katz S, Gilchrest B, Paller AS, Leffell D , editors. Fitzpatrick's Dermatology in General Medicine. 7th ed. New York: McGraw-Hill; 2008. p. 687-703.

4. Babaeinejad SH, Fouladi RF. The efficacy, safety and tolerability of adapalene versus benzoyl peroxide in the treatment of mild acne vulgaris; a Randomized trial. J Drug Dermatol. 2013;12:1033-8.

5. Michel S, Jomard A, Demarchez M. Pharmacology of adapalene. Br J Dermatol 1998;139(52 Suppl):3-7.

6. Haider A, Shaw JC. Treatment of acne vulgaris. JAMA 2004. 292:726-35.

7. Ebling FJG, Cunliffe WJ. Disorders of the sebaceous glands. In:Textbook of Dermatology (Champion RH, Burton JL, Burns DA,Breathnach SM, eds), 6th edn, Vol. 3. Oxford: Blackwell Science,1998 ; 1942.

8. Rathi SK. Acne vulgaris treatment: the current scenario. Indian J Dermatol. 2011;56:7-13.

9. Christophers E, Wolfe HH. Effect of Vitamin A acid on skin; in vitro and in vivo studies. Acta Derm Venereol (Stockh). 1975;74:42-53.

10. Shalita A, Weiss J, Chalker D, Ellis C, Greenspan A, Katz H, et al. A comparison of the efficacy and safety of adapalene gel 0.1% and tretinoin gel 0.025% in the treatment of acne vulgaris: a multicentre trial. J Am Acad Dermatol. 1996;34:482-5.

11. Smith EB, Padilla RS, McCabe JM, Becker LE. Benzoyl peroxide lotion (20%) in acne. Cutis. 1980;25:90-2.

12. Lucky A, Jorizzo JL, Rodriguez D, Jones TM, Stewart DM, Tschen EH. Efficacy and tolerance of adapalene cream 0.1% compared with its cream vehicle for the treatment of acne vulgaris. Cutis. 2001;68:34-40.

13. Baker M, Tuley M, Busdiecker FL, Herndon JH, Slayton RM. Adapalene gel 0.1% is effective and well tolerated in acne patients in a dermatology practice setting. Cutis. 2001;68:41-7.

14. Dubey A, Amane H. Comparative clinical study of efficacy and safety of adapalene 0.1% gel versus benzoyl peroxide 2.5% gel for the treatment of acne vulgaris. Int J Basic Clin Pharmacol,2019;8:2317-21.

15. do Nascimento LV, Guedes AC, Magalhaes GM, de Faria FA, Guerra RM, de C Almeida F. Single-blind and comparative clinical study of the efficacy and safety of benzoyl peroxide 4% gel (BD) and adapalene 0.1% gel (QID) in the treatment of acne vulgaris for 11 weeks. J Dermatol Treat. 2003;14:166-71.

16. Korkut C, Piskin S. Benzoyl peroxide, adapalene and their combination in the treatment of acne vulgaris. J Dermatol. 2005;32:169-73.

17. Mills OH, Kligman AM, Pochi P, Comite H. Comparing 2.5%, 5%, and 10% benzoyl peroxide on inflammatory acne vulgaris. Int J Dermatol. 1986;25:664-7.

ANTIBIOTIC SENSITIVITY PATTERN OF ESCHERICHIA COLI CAUSING URINARY TRACT INFECTION IN AN INDUSTRIAL AREA OF BANGLADESH

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ABSTRACT

Background: Urinary tract infection (UTI) is a very common type of infection affecting people of all ages. E.coli is one of the most common pathogen causing UTI. The incidence of UTIs caused by multidrug-resistant uropathogens has been increasing at an alarming rate worldwide. In this study, we aimed to determine the antibacterial susceptibility patterns of E. coli among patients of a densely populated industrial area of Gazipur, Bangladesh. **Materials and Methods:** The study was conducted between January 2019 to June 2019. This study determine the antibiotic susceptibility of 157 isolates of E.coli from 215 positive urine culture. Urine samples were collected aseptically in sterile containers and then cultured on HiCrome UTI Agar media, blood agar and Mac Conkey's agar media. Susceptibility to antimicrobial agents was tested by disc diffusion technique. Those who were getting antibiotics excluded from the study. Data were analyzed with the help of SPSS Version 20. **Results:** Mean age of the patients was 33.039±16.5 years, among them 65.8% were female. The most frequent causative organisms isolated were Escherichia coli (73.02%) followed by Pseudomonas (7.90%), Klebsiella (6.97%) and Enterococci (7.44%). E.coli was highly resistant to Amoxicillin (76.4%), Cefixime (68.2%) and Ciprofloxacin (65.6%),least resistance was seen with Gentamicin (15.3%),Amikacin (22.3%) and Nitrofurantoin (27%). **Conclusion:** Knowledge of prevalence and antimicrobial susceptibility pattern of E. coli will help in selecting an appropriate antibiotic for empirical therapy. A large, multi-center study will improve the validity and usefulness of the study.

Keywords: E.coli, Urinary Tract Infection, Antibiotic susceptibility,Uropathogens.

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Introduction

Urinary traction infections (UTI) are a group of common diseases that occour predominantly by ascension of normal enteric flora through the urethra into the bladder. UTI can involve any part of urinary system, including the urethra, ureters, bladder and kidneys. UTI is due to an inflammatory response of urothelium to the invading pathogenic organisms[1]. Every woman has 60% lifetime risk of developing cystitis, by contrast, men have lifetime risk of only 13%[2]. It is estimated that 3% of girls and 1% of the boys experience atleast one episode of UTI before 11 years of age[3]. The bacterial causes of UTI include Escherichia coli (E. coli) which causes 80% of the UTI, Klebsiella pneumonia (K.pneumoniae), Citrobacter species, Enterobacter species, Pseudomonas aeruginosa (P. aeruginosa), and Staphylococcus species[4,5].

The benefits of antibiotic use are unavoidable but overuse and misuse is the main problem of resistance amongst uropathogenic bacteria[6,7]. In hospitals, 20-50% of prescribed antibiotics are either unnecessary or inappropriate[8]. The incidence of UTIs caused by multidrug-resistant uropathogens has been increasing at an alarming rate worldwide. Such common infections can turn into life-threatening illnesses, especially in developing countries[9,10]. A recent study has shown that more than 75% of E. coli causing UTI are resistant to third-generation cephalosporin[11]. Appropriate monitoring of the etiology of infections and antibiotic resistance pattern is essential not only for selecting appropriate antibiotics for empirical therapy but also for reducing the overuse or misuse of antibiotics.

Therefore, we aimed to determine the antibacterial susceptibility patterns of E coli among patients of a densely populated industrial area of Gazipur, Bangladesh.

Methodology

This is a cross-sectional study and was conducted at Tairunnessa Memorial Medical College, Gazipur, from January 2019 to June 2019. A total of 806 clean catch-midstream urine samples were collected from outpatients and indoor patients suspected of UTI and then tested for Gram staining, microscopic identification, colony morphology identification and biochemical tests following Clinical Laboratory Standard Institute (CLSI) procedure[12].

Inclusion and exclusion criteria

Patients diagnosed clinically to be having UTI on the basis of symptoms (fever, dysuria & increased frequency of urination were included in the study. The study excluded those patients that were on antibiotic therapy within the week of sample collection.

Sample collection procedure

Clean catch midstream urine samples of patients with suspected urinary tract infections were collected in sterile containers at the laboratory of Tairunnessa Memorial Medical College hospital. The samples were well maintained and transported within thirty minutes while storing in 40 C at the laboratory for further processing and analysis.

Culture specimen

All specimens were cultured on HiCrome UTI Agar media (HiMedia laboratory Pvt ltd in India), blood agar and MacConkey's agar media. A wire loop of (0.001 mL) deep in urine was used to inoculate on media, then, plates were incubated aerobically at 37° C for 24 hours. Urine samples with colony ≥ 105 CFU/ml were taken as significant growth (Positive urine culture = 105 CFU/ml). Significant single colonies were Gram stained. The significant growth was identified further using biochemical tests such as Indole, Citrate Utilization and triple Sugar Iron (TSI) .

Antimicrobial sensitivity testing

Antimicrobial sensitivity testing was done by Kirby- Bauer disc diffusion method. Interpretation as 'Sensitive' or 'Resistant' was done on the basis of the diameters of zones of inhibition of bacterial growth as recommended by the disc manufacturer. Antibiotics against which sensitivity was tested in the present study included Ceftriaxone, Ciprofloxacin, Cefixime, Cefuroxime, Amikacin, Imipenem, Gentamicin, Nitrofurantoin and Amoxicillin. The demographic data and the degree of sensitivity to antibiotics, whether sensitive or resistant, were recorded. The data collected for the period of 06 months were analysed.

Data analysis

Data were analyzed using SPSS Version 20. Univariate data were summarized as frequencies (percentages) for cultured bacteria isolates and drug susceptibility.

Result

A total of 806 urine samples were cultured, 215 samples showed significant growth, whereas majority of the showed no growth. This study determine the antibiotic susceptibility of 157 isolates of E.coli from 215 positive urine culture and their sensitivity pattern pertaining to a period of 06 months (January 2019- June 2019) were analyzed.

We noted that UTI was more common in females 65.6% than males 34.4% (Table-1). Among the study population mean age was 33 years (10 months- 85 years) (Table-2). Among the study population the most frequent causative organisms isolated were Escherichia coli 73.02% followed by Pseudomonas 7.90%, Klebsiella 6.97% and Enterococcus spp 4.65%. (Fig-1).

Based on the present study it was noted that UTI caused by E.coli was sensitive to Nitrofurantoin and Imipenem in about 73% and 62.4% cases respectively. Among the Aminoglycosides the sensitivity of E.coli to Amikacin was 77.7% and to Gentamicin was 84.7% . E.coli was resistant to Amoxicillin in 76.4% cases and to Ciprofloxacin in 65.6% cases. The resistance of E.coli in UTI to Cephalosporins like Cefixime, Cefuroxime, Ceftriaxone were 68.2%, 52.7%, 51.6% respectively (Fig -2)

Table-1: Distribution of study patients by sex

	Frequency	Percent
Male	74	34.4%
Female	141	65.6%
Total	215	100.0

Table-2: Distribution of study patients by age

	Age (Years)
Mean	33.039
Std. Deviation	16.5206
Minimum	0.9
Maximum	85.0

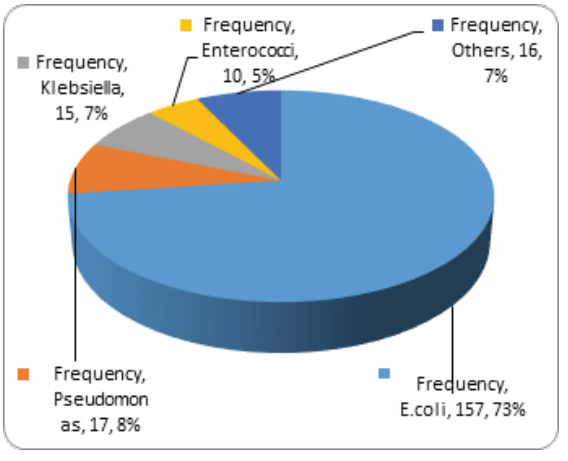
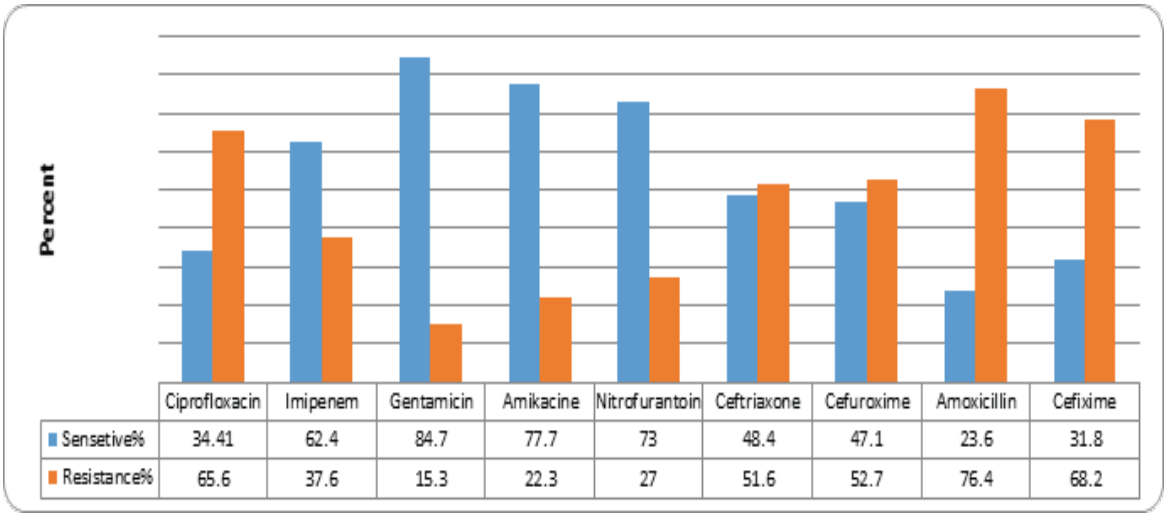


Figure-1: Distribution of UTI causing organisms among study patient



	Ciprofloxacin	Imipenem	Gentamicin	Amikacine	Nitrofurantoin	Ceftriaxone	Cefuroxime	Amoxicillin	Cefixime
Sensetive%	34.41	62.4	84.7	77.7	73	48.4	47.1	23.6	31.8
Resistance%	65.6	37.6	15.3	22.3	27	51.6	52.7	76.4	68.2

Figure -2: Sensitivity pattern of E.coli to various antibiotics

Discussion

The study revealed that females (65.6%) were more susceptible to UTI than males (34.4%), which is also similar to other studies[13,14]. The increased incidence of the urinary tract infection in women is conditioned by favouring anatomic factors, by hormonal changes and by the urodynamic disturbance occurring with age[15].

The predominant number of pathogens isolated in our study were Gram negative bacilli rather than Gram positive pathogens. Bacteriological studies usually reveal the involvement of Gram negative enteric organisms that commonly cause UTI, such as E. coli, Klebsiella species and Proteus species[16]. Similarly, in another study, the most predominant pathogens isolated from UTI were Gram negative bacilli[17] The higher prevalence of Gram negative enteric organisms in UTI cases may be due to the better chances of these organisms getting access to urinary tract from the intestine where they inhabit as normal flora. In our study, majority of isolated bacteria were also the Gram-negative Escherichia coli 73.02%, Pseudomonas 7.90% and Klebsiella 6.97%; and Gram-positive Enterococcus spp 4.65%. Our study, along with previous studies, shows that E.coli is the predominant etiology of UTI.[18-20]

Increased resistance to multiple antibiotics among pathogens causing UTI leads to frequent treatment failure and complications. Drug-resistant UTI has become a major global health problem, especially in developing countries like Bangladesh. In our study, the highest percentages of resistance of Escherichia coli causing urinary tract infections were found for

Amoxicillin (76.4%), Cefixime (68.2%) and Ciprofloxacin (65,6%), whereas the highest percentages of sensitivity were seen for Gentamycine (84,7%), Amikacine (77.7%), Nitrofurantoin (73%) and Imipenem (62.4%). The results are supported by a previous study from Bangladesh.[21,22] This significantly higher bacterial resistance to antibiotics in our region may be due to a higher rate of antibiotic usage, even in the absence of a prescription.[23,24]

Conclusion

Improper use of antibiotics for the treatment of disease prior availability of laboratory culture results has increased the chances of empirical treatment failure. So, it is necessary to know the etiology and determine the antimicrobial susceptibility of bacterial isolates to prevent treatment failure and emergence of drug resistant strains. Constant surveillance of antibiotic sensitivity pattern will help the medical practitioners to use safe and effective therapy in the management of UTI caused by E.coli. A large prospective multicenter study is indispensable to improve the validity and usefulness of the study.

References

1. Prakasam KCA, Kumar KGD, Vijayan M. A cross sectional study on distribution of urinary tract infection and their antibiotic utilization pattern in Kerala. Int J Res Pharm Biomed Sci. 2012; 3(3):1125-1130.
2. Wasnik DD, Tuman PM. Prevalence and antibacterial susceptibility pattern of urinary tract infection causing human pathogenic bacteria. Asian J Biomed Pharm Sci. 2012;2(15):1-3.
3. Mortazavi F, Shahin N. Changing patterns in sensitivity of bacterial uropathogens to antibiotics in children. Pakisthan J Med Sci. 2009; 25(5):801-805.
4. Bitew A, Molalign T, Chanie M. Species distribution and antibiotic susceptibility profile of bacterial uropathogens among patients complaining urinary tract infections. BMC infectious diseases. 2017; 17(1):654.
5. Ronald A. The etiology of urinary tract infection: traditional and emerging pathogens. The American journal of medicine. 2002; 113(1):14-9.
6. Bell B G, Schellevis F,Stoberring E. A systematic review and meta-analysis of the effects of antibiotic consumption on antibiotic resistance. BMC Infect Dis, 2014. Jan 9; 14:13.
7. WHO. Antimicrobial resistance: global report on surveillance 2014.
8. Hulscher ME, Grol RPTM, Meer JW. Antibiotic prescribing in hospitals: a social and behavioural scientific approach. Lancet Infect Dis, 2010. Mar; 10(3): 167-75.
9. Mazzariol A, Bazaj A, Cornaglia G. Multi-drug-resistant Gram-negative bacteria causing urinary tract infections: a review. J Chemother. 2017; 29(sup1):2-9.
10. Gupta A, Bansal N, Houston B. Metabolomics of urinary tract infection: a new uroscope in town. Expert Rev Mol Diagn. 2012; 12(4):361-9.
11. Acherjya GK, Tarafder K, Ghose R, Islam DU, Ali M, Akhtar N, et al. Pattern of antimicrobial resistance to Escherichia coli among the urinary tract infection patients in Bangladesh. Am J Intern Med. 2018; 6(5):132-7.
12. Clinical and Laboratory Standards Institute (CLSI). Performance standards for antimicrobial susceptibility testing, 20th information supplement M100-S20. Wayne, PA, USA: CLSI; 2010.
13. Dimitrov TS, Udo EE, Emara M, Awni F, Passadilla R. Etiology and antibiotic susceptibility patterns of community-acquired urinary tract infections in a Kuwait hospital. Med Princ Pract. 2003; 13(6): 334-339.

14. AkramM, Shahid M, Khan AU. Etiology and antibiotic resistance patterns of community-acquired urinary tract infections in JNMC hospital Aligarh, India. Ann. Clin. Microbiol. Antimicrob. 2007; 6:4.

15. Bobos C, Hodarnau D, Terec L, Feticu F, Alina H. Prevalence and susceptibility to chemotherapeutic agents of bacterial species isolated from urinary tract infections. Clujul Medical. 2010; 83(1):69-75.

16. Stapleton A. Urinary Tract Infections in Patients with Diabetes. Amer J Med 2002; 113: 80S-84S.

17. Boyko EJ, Fihn SD, Scholes D, Abraham L, Monsey B. Risk of urinary tract infection and asymptomatic bacteriuria among diabetic and nondiabetic postmenopausal women. Amer J Epidemiol 2005; 161:557-64.

18. Shigemura k, Tanaka K, Okada H. Pathogen occurrence and antimicrobial susceptibility of urinary tract infection cases during a 20-year period (1983-2002) at a single institution in Japan. Japanese Journal of Infectious Diseases. 2005; 58(5):303-308.

19. Dash M, Padhi S, Mohanty I, Panda P, Parida B. Antimicrobial resistance in pathogens causing urinary tract infections in a rural community of Odisha, India. Journal of Family and Community Medicine. 2013; 20(1):20-26.

20. Omigie O, Okoror L, Umolu P, Ikuuh G. Increasing resistance to quinolones: a four-year prospective study of urinary tract infection pathogens. International Journal of General Medicine. 2009; 2:171-175.

21. Majumder MI, Ahmed T, Hossain D, Begum SA. Bacteriology and antibiotic sensitivity patterns of urinary tract infections in a tertiary hospital in Bangladesh. Mymensingh Med J. 2014 Jan; 23(1):99-104.

22. Akhter N, Rahman R, Sultana S, Antimicrobial Sensitivity Pattern of Escherichia coli Causing Urinary Tract Infection in Bangladeshi Patients. American Journal of Microbiological Research. 2016; 4(4):122-125.

23. Garau J, Xercavins M, Rodriguez-Carballeira M, Gomez-Vera JR, Coll I, Vidal D, et al. Emergence and dissemination of quinoloneresistant Escherichia coli in the community. Antimicrob Agents Chemother 1999; 43:2736-41.

24. Natsch S, Conrad C, Hartmeier C, Schmid B. Use of amoxicillin-clavulanate and resistance in Escherichia coli over a 4-year period. Infect Control Hosp Epidemiol 1998; 19:653-6.

FINE-NEEDLE ASPIRATION CYTOLOGY IN THE DIAGNOSIS OF SALIVARY GLAND TUMORS: A FIVE-YEAR EXPERIENCE FROM TWO CENTERS IN BANGLADESH

Mehdi Ashik Chowdhury[1], Fahmida Siddika[2], Ahmad Zubair Mahdi[3], Nure Tamanna[4], Akash sheikh[5].

ABSTRACT

Fine-needle aspiration cytology (FNAC) is a well-established diagnostic tool for evaluating salivary gland tumors. This retrospective study evaluates the diagnostic utility of FNAC in differentiating benign and malignant salivary gland lesions over a five-year period. A total of 100 cases were included from Tairunnessa Memorial Medical College and Popular Diagnostic Centre, Gazipur. Of these, 77 were benign and 23 malignant. FNAC demonstrated high sensitivity and specificity, closely matching findings from international studies. Pleomorphic adenoma was the most frequently diagnosed tumor. FNAC proved to be a rapid, reliable, and minimally invasive technique, supporting its role as a first-line investigation in salivary gland tumors.

Highlights

- Five-year retrospective study on 100 salivary gland tumors
- Conducted at two prominent institutions in Bangladesh
- FNAC showed high diagnostic accuracy
- Pleomorphic adenoma was the most common lesion
- FNAC proved effective in differentiating benign and malignant tumors

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Introduction

Salivary gland tumors represent a diverse group of neoplasms with varying histological types and biological behaviors. They constitute approximately 3-6% of all head and neck tumors, with the majority arising in the parotid gland, followed by the submandibular, sublingual, and minor salivary glands. Accurate preoperative diagnosis is critical for appropriate surgical planning and patient management.

Fine-needle aspiration cytology (FNAC) has gained widespread acceptance as a primary diagnostic modality due to its simplicity, safety, cost-effectiveness, and ability to provide rapid results with minimal patient discomfort. Compared to incisional biopsy, FNAC reduces the risk of tumor seeding and facilitates early clinical decision-making.

Previous studies, such as those by Stewart et al. (2000) and Zbären et al. (2001), have demonstrated high diagnostic accuracy for FNAC, with reported sensitivity ranging from 80% to 97% and specificity exceeding 90%. The introduction of the Milan System for Reporting Salivary Gland Cytopathology (MSRSGC) has further improved reporting uniformity and risk stratification, helping pathologists communicate more effectively with clinicians.

In Bangladesh, limited resources and increasing patient burden make FNAC an invaluable tool in outpatient and diagnostic centers. This five-year retrospective study was undertaken at two prominent diagnostic institutions to assess the reliability of FNAC in salivary gland tumor diagnosis and to compare findings with both regional and international data.

Materials and Methods

This retrospective cross-sectional study was conducted at Tairunnessa Memorial Medical College and Popular Diagnostic Centre, Gazipur. Data from January 2018 to March 2023 were analyzed. Inclusion criteria were all patients undergoing both FNAC and subsequent histopathological examination of salivary gland masses. FNACs were performed using 22-24 gauge needles, and smears were stained using Papanicolaou and Giemsa stains. Final diagnoses were confirmed by histopathology.

Results

Out of 100 patients, 77 cases were benign and 23 were malignant based on histopathology. Pleomorphic adenoma was the most common benign tumor, observed in 55 cases. Warthin tumor (10 cases) and basal cell adenoma (6 cases) were other benign lesions. Among malignancies, mucoepidermoid carcinoma (9 cases), adenoid cystic carcinoma (6 cases), and carcinoma ex pleomorphic adenoma (4 cases) were noted.

Table 1: Histological Diagnosis of Salivary Gland Tumors

- Pleomorphic adenoma: 55
- Warthin tumor: 10
- Basal cell adenoma: 6
- Mucoepidermoid carcinoma: 9
- Adenoid cystic carcinoma: 6
- Carcinoma ex pleomorphic: 4
- Other malignant tumors: 4

FNAC diagnosed 74 cases as benign and 21 as malignant. Five cases were reported as inconclusive.

Diagnostic metrics:

- Sensitivity: 95.6%
- Specificity: 98.7%
- Accuracy: 97.2%
- PPV: 91.3%
- NPV: 98.6%

Age and Gender Distribution:

- <30: 11
- 31–40: 23
- 41–50: 26
- 51–60: 19
- >60: 21

Discussion

Our study validates FNAC as a reliable, minimally invasive method for evaluating salivary gland lesions, particularly in resource-limited settings like Bangladesh. The overall diagnostic accuracy of 97.2%, sensitivity of 95.6%, and specificity of 98.7% observed in our cohort reaffirm findings from other international studies, including those by Stewart et al. (2000), Boccato et al. (1998), and Zbären et al. (2001), where similar diagnostic metrics were reported.

Pleomorphic adenoma was the most common tumor (55%), which mirrors findings from Jain et al. (2013), Eveson et al. (2005), and Al-Khafaji et al. (1998), who documented pleomorphic adenomas as the predominant benign salivary gland tumor across various geographic regions. This is expected, as pleomorphic adenomas account for 60-70% of benign parotid tumors globally.

Among malignant lesions, mucoepidermoid carcinoma (9%) and adenoid cystic carcinoma (6%) were predominant, consistent with reports by Qizilbash et al. (1985), Goudeli et al. (2023), and Rossi et al. (2017). Carcinoma ex pleomorphic adenoma was observed in 4% of our cases, again aligning with the literature that suggests malignant transformation occurs in approximately 3-5% of long-standing pleomorphic adenomas.

Our inconclusive FNAC rate of 5% is within acceptable international benchmarks. Goudeli et al. reported a similar rate of 6%, while Boccato et al. (1998) and Zbären et al. (2001) documented rates ranging between 4-10%. Use of image guidance, particularly ultrasound, could reduce nondiagnostic yields and improve aspirate adequacy.

The age distribution of patients in our cohort-predominantly within the 31-60 age group-aligns with patterns seen in other regional studies. Female predominance noted in our series also reflects the demographic trends seen by Jain et al. and Stewart et al.

Compared to studies with lower malignancy rates (e.g., Goudeli et al. with 11%), our higher malignancy incidence (23%) may reflect referral bias due to our centers serving as tertiary diagnostic hubs. Our findings support early oncological intervention when FNAC suggests malignancy and more conservative approaches in confirmed benign lesions.

Compared to studies with lower malignancy rates (e.g., Goudeli et al. with 11%), our higher malignancy incidence (23%) may reflect referral bias due to our centers serving as tertiary diagnostic hubs. Our findings support early oncological intervention when FNAC suggests malignancy and more conservative approaches in confirmed benign lesions.

Finally, FNAC's value in low-resource countries cannot be overstated. The combination of high diagnostic yield, minimal invasiveness, and low cost makes it indispensable for salivary gland tumor evaluation in outpatient settings, particularly where histopathological facilities are limited or delayed.

Pleomorphic adenoma accounted for the majority (55%) of our cases, reflecting its global predominance. Similar rates were documented by Jain et al. (2013) in India and Al-Khafaji et al. (1998) in the U.S. Mucoepidermoid carcinoma was the most frequent malignancy, as seen in our cohort and studies by Zbären et al. (2001) and Qizilbash et al. (1985).

Our inconclusive rate of 5% is comparable to Goudeli et al. (6%) and Boccato et al. (5-10%). Use of ultrasound-guided FNAC has been shown to reduce this rate. Our patient demographics align with global trends, showing female predominance and most cases in the 31-60 age group, consistent with studies by Jain et al. and Rossi et al.

Our malignancy rate (23%) is higher than Goudeli et al. (11%), likely due to referral bias, and comparable to Zbären et al. (20%). FNAC results were vital for treatment planning-supporting elective surgery or conservative follow-up for benign cases and early oncologic referral for malignancies.

Our findings support implementing the Milan System to standardize reporting. This would enhance diagnostic communication and reproducibility. FNAC continues to be an essential diagnostic tool in low-resource settings.

Conclusion

FNAC remains a cornerstone in the diagnosis of salivary gland tumors, demonstrating excellent diagnostic accuracy in distinguishing benign from malignant lesions. Its minimal invasiveness, cost-effectiveness, and reliability support its use in routine clinical practice, especially in resource-limited environments.

References

1. Goudeli C et al. Cureus. 2023; 15(7):e43076.
2. Orell SR, Sterrett GF. Atlas of FNAC. Elsevier; 2012.
3. Eveson JW et al. WHO Classification. IARC Press; 2005.
4. Stewart CJ et al. Diagn Cytopathol. 2000; 22(3):139-146.
5. Boccato P et al. Acta Cytol. 1998; 42(4):888-898.
6. Zbären P et-1992.
7. Jain R et al. J Oral Maxillofac Pathol. 2013; 17(1):56-61.
8. Al-Khafaji BM et al. Cancer. 1998; 84(3):153-159.
9. Qizilbash AH et al. Diagn Cytopathol. 1985; 1(1):3-14.
10. Rossi ED et al. Cancer Cytopathol. 2017; 125(10):757-766.

EFFECT OF METFORMIN AND PITAVASTATIN ON LIVER FUNCTION IN DIABETIC RATS: ASSESSMENT OF SGPT

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ABSTRACT

Background: Diabetes is a major medical concern worldwide. This disease is associated with multifactorial disorders. Therefore, combination therapies can be effective for prevention of further complications. **Objectives:** The present study has been carried out with aim to compare the effect of Metformin and Pitavastatin on liver function by assessing SGPT when used simultaneously to single drug therapy in diabetic rats. **Materials and Methods:** 48 healthy male Wister strains of albino rats were selected for the study. Intraperitoneal injections of alloxan monohydrate were utilized to induce diabetic mellitus type II in the rats and divided them into six groups, each consisting of seven rats. Group I is normal control group treated with normal feeds only. Group II is diabetic groups, Group IIA served as diabetes control. Group IIB and IIC were administered with metformin and pitavastatin orally for 15 days respectively. The combination of Metformin and pitavastatin were administered to group IID and IIE of diabetic rats for 15 days. On the last day blood samples were collected and subjected to SGPT estimation. The metformin and pitavastatin solution were prepared every 48hrs to maintain its activity. Data were analyzed using ANOVA in each variable. **Result:** In present study we have observed significant ($p < 0.001$ for all) higher level of serum SGPT in diabetic groups compared to non-diabetic group of rats. Serum level of SGPT was found not significant in group IID and IIE in compare to normal control group after 15 days of combination therapy with Metformin and Pitavastatin. **Conclusion:** The Combination of Metformin and Pitavastatin is able to improve SGPT level on hyperglycemic rats when compare to metformin and pitavastatin alone.

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Introduction

According to the 2021 report by the IDF, approximately 537 million individuals globally were affected with diabetes, constituting roughly 10.5% of the world's populace[1]. Diabetes affects individuals of all ages, genders, and geographic locations, making it one of the most prevalent global causes of mortality and morbidity[1]. According to the Global Disease Burden 2019, the primary and second-leading causes of the worldwide disease burden were ischemic heart disease and stroke in 2019. Diabetes is regarded to be a significant precursor for the both disorders[1].

This condition is associated with insulin resistance (IR), which contributes to dyslipidemia[2]. Metformin is an antihyperglycemic agents of biguanide family used to treat non-insulin-dependent Diabetes Mellitus (NIDDM)[3,4]. Metformin reduces hepatic insulin resistance and hyperglycemia, and is the first-line treatment for type 2 diabetics, especially those with hyperlipidemia[2]. It can be administered either alone or in combination with other agents[5].

Dyslipidemia is very much common in diabetes. Therefore, prevention of coronary artery disease in diabetes has become an emerging issue to be resolved. People of high cholesterol are often prescribed statins to lower their total cholesterol which reduces their risk of heart attack and stroke. Statins block a substance that liver needs to make cholesterol[6].Statins are considered the first-line lipid-lowering therapeutics for the primary and secondary prevention of circulatory disease[7,8]. Statins are 3-hydroxy-methylglutaryl coenzyme A (HMG-CoA) reductase inhibitors and prevent converting HMG-CoA to mevalonate by reducing cholesterol synthesis[7]. In comparison with other statins, pitavastatin showed neutral, even at the highest dosage[7].

Both metformin and statins thus act on glucose-as well as lipid metabolism therefore metformin–statin combination therapy is prescribed to many T2DM patients[9].

In Clinical Practice, combination drug therapy has become common in treating many disease conditions. The purpose of these combinations is often to ensure optimal efficacy and to reduce adverse effects that may arise from monotherapy.

The present study was intended for studying effect of Metformin and Pitavastatin in diabetic rats. Alloxan has been chosen to induce diabetes in rats as it is widely used to induce experimental diabetes. Alloxan causes diabetes by a mechanism which basically involves partial degeneration of beta-cells of pancreatic islets and subsequent compromise in the quality and quantity of insulin produced by these cells[10]. The current study focuses on the comparing the safety margin of Metformin and Pitavastatin when given alone as well as in combination in Wister albino rats and analyzed by biochemical parameters SGPT as liver marker.

Materials and Methods

Materials

Animal:

A total number of 48 healthy male Wister strains of Albino rats weighting to 180-220 grams and ages between 10-12 weeks were selected for the study and which was collected from BCSIR, Dhaka. They were kept in animal house of Department of Pharmacology, Dhaka Medical College and were feed standard rat pellets collected from ICDDR'B Dhaka. Rats of different Groups were kept in different metallic cages and allowed to drink ab libitum and maintained under standard laboratory conditions. These rats were acclimatized for 3 days at room temperature and humidity before commencement of the study. Animal described as fasted were deprived of food for 16 hours but had free access to water. It is to be noted that out of 48 rats 6 rats were dead during the study period.

Chemicals

Drugs:

a. Metformin: Metformin was supplied by Square Pharmaceuticals, Dhaka.

b. Pitavastatin: Pitavastatin was supplied by Square Pharmaceuticals, Dhaka.

Reagents:

a. Alloxan: Alloxan was supplied by Millon chemicals. Alloxan was dissolved in normal saline and was administered intraperitonially in a dose of 120 mg/kg body weight.

b. Reagents for estimation of SGPT.

c. Normal saline.

Instruments and accessories

Glucometer
Ryle's tube
Syringe
Sterile blade
Safety rubber gloves
Electronic digital balance
Conical flask.

Methods

Type of study: This was an Experimental Study.

Place of study: This study was conducted at Department of Pharmacology, Dhaka Medical College, Dhaka.

Period of study: Total study period was one year extending from January 2018 to December 2018.

Sample size: Sample size was 42 adults (180-220 gm) Wister strains of Albino rats.

Sampling Technique: Stratified Random Sampling was followed for the selection of sample

Alloxan induction in animal model:

It was an experimental study, which designed to demonstrate the effect of combination therapy of Metformin and Pitavastatin on blood glucose level comparing to single drug of Metformin and Pitavastatin on Alloxan induced diabetic rats. The rats were divided randomly into two Groups containing 7 rats in Group I (Normal control Group) and 40 rats in Group II (diabetic Group). To induce diabetes, these 40 rats of Group III were kept fasting overnight and 120 mg of Alloxan per kg body weight was injected intraperitoneally to each of the rats. The rats were than kept in cages with 5% glucose bottles to prevent hypoglycemia. After 72 hours of Alloxan injection to the rats, serum blood glucose level was estimated to measure the glycemic status, where blood was collected from the tail vein with aseptic precaution. Thirty-five rats became diabetic after 72 hours and 5 rats were died. All those 35 rats having blood glucose level ≥11.11 mmol/L, and were considered as diabetic, and further divided randomly into five Groups as IIA, IIB, IIC, IID and IIE. Each Group contained 7 rats. The Group II was treated as normal control and IIA was treated as diabetic control and the Groups IIB, IIC, IID and IIE were taken as experimental Groups. The day after 72 hours of Alloxan injection was considered as first day of follow up.

- Group I normal control Group
- Group IIA Diabetic control Group
- Group IIB diabetic rats treated with Metformin 100 mg/kg body weight
- Group IIC diabetic rats treated with Pitavastatin 2 mg/kg body weight
- Group IID diabetic rats treated with Metformin 100 mg/kg and Pitavastatin 2 mg/kg body weight
- Group IIE diabetic rats treated with Metformin 200 mg/kg and Pitavastatin 4 mg/kg body weight.

Group- I: This Group contained 7 rats, which were given standard rat diet and water for 15 days. Serum SGPT were measured on day 15.

Group- Ⅱ: Fasting blood glucose levels and body weights of 40 rats were checked on 1st day of experiment before induction of diabetes. Then the rats were given intraperitoneal injection of Alloxan at a dose of 120 mg/kg b.w. After Alloxan injection rats were provided with 15% glucose solution for 24 hours to prevent hypoglycemia along with standard pellet diet and water ad labitum. Out of 40 rats, 5 rats were died within 3 days after Alloxan induction. Fasting blood glucose level was estimated 72 hours after Alloxan injection. Rats having blood glucose level ≥11.11 mmol/L were considered as diabetic and used for this study. All experimental rats became diabetic and further Grouped as IIA, IIB, IIC, IID and IIE. Each group contained 7 alloxan induced diabetic rats.

Group IIA: In this Group, the diabetic rats were left untreated. Again, on day 15, SGPT levels were estimated.

Group ⅡB: In this Group, Alloxan induced diabetic rats were treated with Metformin 100 mg/kg orally by ryles tube for 15 days and, SGPT were estimated on 15th day.

Group ⅡC: In this Group, Alloxan induced diabetic rats were treated with Pitavastatin 2 mg/kg orally by ryles tube for 15 days, SGPT were estimated on 15th day.

Group ⅡD: In this Group, Alloxan induced diabetic rats were treated with Metformin 100 mg/kg and Pitavastatin 2 mg/kg orally by ryles tube for 15 SGPT were estimated after 15 days.

Group IIE: In this Group, Alloxan induced diabetic rats were treated with Metformin 200 mg/kg and Pitavastatin 4 mg/kg orally by ryles tube for 15 days SGPT were estimated on day 15th.

Biochemical parameters analysis

The biochemical parameters-SGPT (serum glutamate pyruvate transaminase) were analyzed in all six Groups.

Estimation of SGPT Level on day 15

SGPT was found in variety of tissues but was mainly found in the liver. Increased levels were found in hepatitis, cirrhosis, obstructive jaundice and other hepatic disease.

Principle of the method

SGPT found converts L-Alanine and α ketoglutarate to pyruvate and Glutamate. The pyruvate formed reacts with 2, 4, Dinitrophenyl hydrazine to produce a hydrazine derivative, which was an alkaline medium produces a brown colored complex whose intensity was measured. The reaction does not obey Beers law and hence a calibration curve was plotted using a pyruvate standard.

L-Alanine+α ketoglutarate→pyruvate+L- Glutamate (in presence of SGPT and pH 7.4)

Pyruvate+2, 4, DNPH→2, 4, Dinitrophenyl Hydrazone (in Alkaline media) (a brown colored complex), Reference value: 17-50U/L.

Data collection and statistical analysis

All the results were appropriately recorded in data collection form. Statistical analysis was done by SPSS version 22.0. The variables were expressed as mean±SD. The inter-Group comparison was analyzed by one-way ANOVA. Student`s t-test was done for comparison of means. Statistical significance was considered at 5% level of significance.

Ethical consideration

Prior to commencement of the study, after the departmental review, the research protocol was approved by the Ethical Review Committee of Dhaka Medical College, Dhaka. The present study was experimental one involving animal. Proper permission regarding animal purchase, transport and experiment was obtained. Permission was also be taken for housing, administrating foods on a standard rat pellet, collection of blood sample for biochemical analysis and sacrifice of animals under light anesthesia.

Results

Table-1: Comparison of serum SGPT levels among different groups.

Groups	Mean±SD	F-value	p -value
Group I	35.71±14.95	6.242	<0.001**
Group IIA	74.71±8.64		
Group IIB	56.57±15.74		
Group IIC	66.29±12.74		
Group IID	47.00±20.62		
Group IIE	44.71±16.97		

Table 1 showed that group IIA (diabetic control) had highest (74.71±8.64) and group I (Normal control) had lowest (35.71±14.95) mean SGPT level among all the six groups. Whereas in all groups there were significant difference in mean SGPT levels. The ranges were in group I (18-56) U/L, group IIA (65-90) U/L, group IIB (37-77) U/L, group IIC (47-80) U/L, group IID (27-70) U/L and group IIE (18-62) U/L.

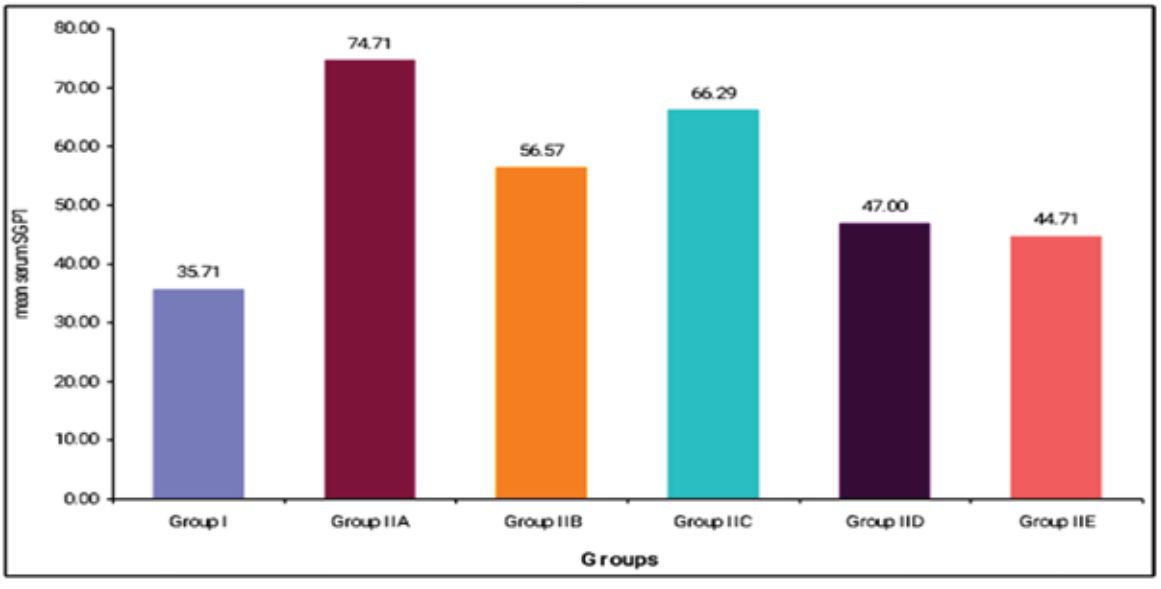

Figure -1: Simple bar diagram showing the mean serum SGPT in different groups.

Figure 1 elaborated comparison of mean SGPT level in different groups of rats after end of drug administration. Group IIA showed the highest level of SGPT compared to other groups (74.71±8.64) and group I (Normal control) had lowest (35.71±14.95) mean SGPT level. Whereas in all groups there were significant difference in mean SGPT levels among them. The ranges were in group I (18-56) U/L, group IIA (65-90) U/L, group IIB (37-77) U/L, group IIC (47-80) U/L, group IID (27-70) U/L and group IIE (18-62) U/L.

Table- 2: Comparing the SGPT level of different groups with normal control group at the end of drug administration.

Groups	Mean±SD	t-value	p-value
Group I	35.71±14.95		
vs Group IIA	74.71±8.64	5.976	<0.001**
vs Group IIB	56.57±15.74	2.542	0.026**
vs Group IIC	66.29±12.74	4.118	0.001**
vs Group IID	47.00±20.62	1.172	0.264^{ns}

Table 2 showed there was significant increase in mean SGPT level in IIA, IIB and IIC (74.71±8.64, 56.57±15.74 and 66.29±12.74) but group IID and group IIE (47.00±20.62 and 44.71±16.97) showed no significant difference in SGPT level in comparison to group I (normal control group-35.71±14.95). The ranges of SGPT were in group I (18-56) U/L, group IIA (65-90) U/L, group IIB (37-77) U/L, group IIC (47-80) U/L, group IID (27-70) U/L and group IIE (18-62) U/L.

Table-3: Comparison of serum SGPT of Metformin and Pitavastatin between group IIA (diabetic control group) with other groups at the end of drug administration.

Groups	Mean±SD	t-value	p-value
Group IIA	74.71±8.64		
vs Group IIB	56.57±15.74	2.674	0.020**
vs Group IIC	66.29±12.74	1.449	0.173^{ns}
vs Group IID	47.00±20.62	3.280	0.007**
vs Group IIE	44.71±16.97	4.169	0.001**

Table 3 showed that group IIC (66.29±12.74) showed no significant difference in SGPT level but group IIB, IID and IIE (56.57±15.74, 47.00±20.62 and 44.71±16.97) are significantly lower than group IIA (Diabetic control group -74.71±8.64). The ranges of SGPT were in group IIA (65-90) U/L, group IIB (37-77) U/L, group IIC (47-80) U/L, group IID (27-70) U/L and group IIE (18-62) U/L.

Discussion

This experimental study was carried out to evaluate SGPT level as a liver function marker to look for the effects of Metformin and Pitavastatin when administered alone and in combination in Alloxan induced diabetic rats.

In the present study, diabetes was induced by Alloxan. Other than the normal control group, diabetic groups were administered Alloxan intraperitonially in a single dose of 120 mg/kg body weight to overnight fasted animal. Which produces significant increase in blood glucose level observed 72 hours following administration of Alloxan it was done accordingly[11]. The animals with blood glucose level 11.11 mmol/L or over were supposed to be diabetic[11]. The mean fasting blood glucose level of group IIA on the first day follow up was 15.07mmol/L and Standard Deviation 2.37. It was found that hyperglycemia occurs by intraperitoneal administration of Alloxan at a dose of 120 mg/kg body weight in the experimental rats. Here, the rises in blood glucose level in experimental hyperglycemic rats were also highly significant as compared to normal control Group. Thus, the findings of this study are in well agreement with the findings of other researchers and it is concluded that Alloxan is a potent hyperglycemic agent in rats.

The SGPT is a potent liver marker enzyme which is increased during diabetic conditions that reveal hepatic damage[12]. After two weeks of treatment that there was significant increase in mean SGPT level in diabetic control group 74.71 U/L and Standard Deviation 8.64 compared to mean of normal control group 35.71 U/L and Standard Deviation 14.95 but following treatment with Metformin in combination regimen it was observed that the level of liver marker enzymes reached their normal level in group IID where mean value was 47.00 U/L and Standard Deviation 20.62 and in group IIE mean value was 44.71U/L and Standard Deviation 16.97. On the contrary Pitavastatin monotherapy failed to return the liver enzymes to their normal level[13]. These findings are supported to the findings are previously published report[11].

Conclusion

It can be concluded that Metformin alone improves the SGPT levels in diabetic rats whereas, Metformin in combination with Pitavastatin results more improved SGPT levels among all groups. Therefore, simultaneous use of Metformin and Pitavastatin is safer combination.

Reference:

1. Hossain MJ, Al-Mamun M, Islam MR. Diabetes mellitus, the fastest growing global public health concern: Early detection should be focused. Health, National Library of Medicine, 2024 Mar 22; 7(3):e2004.
2. Almuttairi RS. The Effects of Metformin Treatment on Diabetic Albino Rats' Pancreas, Liver, and Kidney Histology. Arch Razi Inst. 2023; 78(1):459-463.
3. Al Za'abi M, Ali BH, Al Suleimani Y, et al. The Effect of Metformin in Diabetic and Non-Diabetic Rats with Experimentally-Induced Chronic Kidney Disease. Biomolecules. 2021; 11(6):814.
4. Menesi F A, Sherif F M, Gharadwi M E, Denna E E, Mursi S, Othman G, Younis M Y, Shari F E, Debani A H E and Abdellatif A G., 2017. A Comparative Study of Metformin alone, in Combination with Insulin or Metformin Plus Insulin in Presence of Simvastatin in Lybian Diabetic Patients, Pharmacy & Pharmacology International Journal, 2017; 5(2):1-5.
5. Geerling J J, Boom M R, van der Zon G C, van den Berg S A A, van den Hoek A M, Lombès M, Princen H M G, Havekes L M, Rensen P C N and Guigas B, 2014. Metformin Lowers Plasma Triglycerides by Promoting VLDL- Triglyceride Clearance by Brown Adipose Tissue in Mice, Diabetes, 63(3): 880-891.
6. Schofield J D, Liu Y, Rao-Balakrishna P, Malik R A and Soran H, 2016. Diabetes Dyslipidemia, Diabetes therapy: research, treatment and education of diabetes and related disorders, 2016; 7(2):203-219.
7. Lee J, Kim MH, Lee JM, Chang SA. Does Pitavastatin Therapy for Patients with Type 2 Diabetes and Dyslipidemia Affect Serum Adiponectin Levels and Insulin Sensitivity? J Clin Med. 2022; 11(22):6756.
8. Soran H., France M., Adam S., Iqbal Z., Ho J.H., Durrington P.N. Quantitative evaluation of statin effectiveness versus intolerance and strategies for management of intolerance. J. Atherosclerosis. 2020; 306:33-40.
9. Mandumpal Chacko S, Thambi Thekkekara P. Combined Effect of Metformin and Statin. Metformin-Pharmacology and Drug Interactions. IntechOpen journal; 2021.
10. Ighodaro O M, Adeosun A M and Akinloye O A. Alloxan-induced diabetes, a common model for evaluating the glycemic-control potential of therapeutic compounds and plants extracts in experimental studies, Medicina, 2018; 53:65-374.
11. Islam MT, Nasri, S, Rashid M, Sultana T, Kawsar MS, Sumon M H U and Sohel M D, Beneficiary Effect of Combination Therapy of Metformin and Pitavastatin Drug on Alloxan Induced Diabetic Rats Comparing to Single Drug Therapy, Journal of Clinical & Experimental Pharmacology, 2016; 6(4):1-7.
12. Kava1 DM, Lad HD, Comparative study of assessment of liver function in type II diabetes mellitus with non-diabetic individuals, Medpulse International Journal, 2019; 11
13. Cheon DY, Jo SH. Adverse effects of statin therapy and their treatment. Cardiovascular Prevention Pharmacotherapy. 2022;4(1):1-6.

AN INCIDENTAL FINDING OF MICROFILARIA IN URINE CYTOLOGY SMEAR: A CASE REPORT

Chowdhury MA[1], Dash R[2]

ABSTRACT

Microfilariae are parasitic nematodes commonly identified in peripheral blood smears. However, on rare occasions, they may be incidentally detected in exfoliative cytology smears, including urine.This case report highlights a rare incidental detection of microfilariae in urine cytology from a 50-year-old female undergoing routine urinary tract evaluation.This unexpected finding emphasizes the significance of meticulous microscopic screening and the potential of cytology to reveal unsuspected parasitic infections, even from atypical anatomical sites.

Keywords: Microfilaria,Urine Cytology,Incidental Finding,Filariasis,Wuchereria bancrofti.

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Introduction

Lymphatic filariasis is a mosquito-borne tropical disease caused by filarial worms such as Wuchereria bancrofti, Brugia malayi, and Brugia timori. It is prevalent in tropical and subtropical regions, including Bangladesh.Typically, the microfilarial stage is identified in peripheral blood, particularly during the nocturnal peak. Detection in other body fluids, such as pleural fluid, peritoneal fluid, cervicovaginal smears and urine, is extremely rare and generally incidental.The urinary tract is an uncommon site for microfilarial infestation. The presence of microfilariae in urine may be attributed to rupture or erosion of lymphatic vessels into the urinary tract, particularly in chronic filariasis or cases with lymphatic obstruction. In the absence of overt clinical symptoms or peripheral blood eosinophilia, diagnosis rests entirely on careful cytological evaluation. This case underscores the diagnostic value of urine cytology in detecting asymptomatic parasitic infections.

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Case Presentation

A 50 years old female presented to the Asian Diagnostic Centre, Tongi, with complaints of vague lower abdominal discomfort and mild dysuria persisting for approximately two weeks. She also noted a subtle increase in urinary frequency but denied hematuria, pyuria, fever, weight loss, flank pain, or any constitutional symptoms. There was no prior history of urinary tract infections, chronic illnesses, recent travel to endemic areas or family history of filariasis.

Clinical examination revealed a well-nourished individual with stable vital signs. There was no lymphadenopathy, scrotal swelling, pedal edema, or organomegaly on general and systemic examination. The genitourinary and lymphatic systems were unremarkable. Routine urine analysis demonstrated a pale yellow, slightly turbid specimen with normal specific gravity (1.020) and pH (6.5). No hematuria, pyuria, proteinuria, glycosuria, or ketonuria was observed. Microscopy revealed a few epithelial cells and granular debris, without red or white blood cells. A cytocentrifuged urine sample was stained with Giemsa for detailed cytological evaluation.

Microscopic examination revealed the presence of multiple slender, sheathed organisms with gently curved bodies, measuring 270-300 μm in length, possessing a clear cephalic space and atail tip free of nuclei-morphologically consistent with Wuchereria bancrofti. No adult worms or inflammatory exudates were identified. The background consisted of sparse epithelial cells and minimal debris.

To confirm systemic involvement, a nocturnal peripheral blood smear was performed, which was negative for microfilariae. The absolute eosinophil count (AEC) was 280 cells/μL-within the normal reference range. Chest radiography and abdominal ultrasonography were unremarkable.

Based on cytological identification, a diagnosis of asymptomatic urinary filariasis was made. The patient was prescribed diethylcarbamazine (DEC) 6 mg/kg/day for 12 days as per national guidelines. Follow-up after two weeks showed resolution of urinary symptoms and no adverse reactions to therapy. Screening of close household contacts was advised.

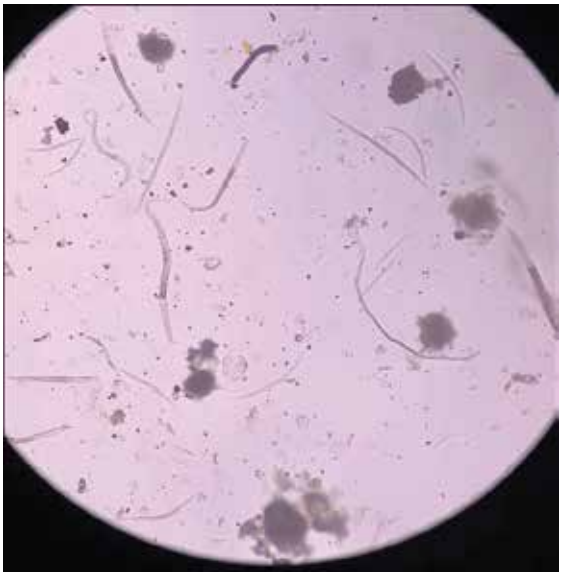

Figure : Microfilaria in urine smear

Discussion

Microfilariae, the larval forms of filarial nematodes such as Wuchereria bancrofti, are classically detected in peripheral blood smears, typically during nocturnal hours due to their periodicity. However, their detection in extravascular sites or non-hematologic body fluids—such as pleural, peritoneal, cerebrospinal

fluid, and urine—is exceedingly rare and often presents a diagnostic challenge.These atypical presentations highlight the importance of meticulous microscopic examination in routine cytopathology, particularly in endemic regions[1,2]. The present case is noteworthy for several reasons. Firstly, the detection of W. bancrofti microfilariae in urine is an uncommon occurrence. Such findings are usually associated with clinical manifestations like chyluria, hematuria, or lymphuria[3,4]. Remarkably, our patient lacked these typical urinary symptoms as well as classical signs of lymphatic filariasis such as elephantiasis, hydrocele, scrotal swelling, or regional lymphadenopathy. This underscores the often subtle and asymptomatic nature of filarial infections.

Secondly, peripheral blood smear analysis was negative for microfilariae, and there was no eosinophilia—both of which are commonly supportive of parasitic infection. These findings suggest a low systemic parasite burden or localized lymphatic disruption that allowed microfilariae to enter the urinary tract. It is hypothesized that rupture or fistulous communication between lymphatic vessels and the urinary collecting system may permit such localized shedding of microfilariae, particularly in chronically exposed individuals from endemic regions[5].

The literature supports the existence of such rare presentations. Arora et al.[6] reported the incidental finding of microfilariae in urine cytology during infertility evaluation. Other authors have documented the presence of filarial organisms in cervicovaginal smears, breast aspirates, thyroid fine-needle aspiration cytology (FNAC), and body cavity effusions[7–9]. These reports, including those by Rao et al. and Sodhani et al.,emphasize the value of cytology in detecting occult filarial infections in unsuspected anatomical sites, reinforcing its diagnostic utility in endemic zones like India and Bangladesh[8,9].

From a public health standpoint, such incidental diagnoses are crucial. Asymptomatic carriers, like the patient in this case, can serve as silent reservoirs of infection, thereby sustaining disease transmission in endemic communities. Routine cytological or hematological screening, even in the absence of clinical symptoms, can therefore contribute significantly to lymphatic filariasis elimination efforts[10] .

Treatment with diethylcarbamazine (DEC) remains the cornerstone of therapy due to its effectiveness against both adult worms and microfilariae. Our patient demonstrated a favorable response, underscoring the importance of early detection and timely intervention. Nevertheless, long-term follow-up is advisable to monitor for recurrence or progression to chronic sequelae[11].

In conclusion, this case highlights the need for cytopathologists to maintain a high index of suspicion for parasitic infections, especially in endemic settings. Urine cytology, though often underutilized, can provide critical diagnostic insights and should not be overlooked when evaluating atypical cellular findings.

Conclusion

This case emphasizes the diagnostic significance of routine cytological examination in urine, even in asymptomatic patients. The identification of microfilariae in a non-hematological fluid such

as urine should prompt further clinical evaluation and initiation of appropriate antiparasitic therapy. Timely diagnosis in such incidental presentations can help reduce morbidity and prevent progression to chronic lymphatic complications

References

1. Park K. Epidemiology of communicable diseases. In: Park's Textbook of Preventive and Social Medicine. 24th ed. Jabalpur: M/s Banarsidas Bhanot; 2017.
2. Varghese R, Raghuveer CV, Pai MR, Bansal R. Microfilariae in cytologic smears: a report of six cases. Acta Cytol. 1996; 40(2): 299-301.
3. Gupta K, Sehgal A, Puri M, Suri S. Microfilariae in cervicovaginal smears-a report of five cases. Acta Cytol. 2002; 46(2):359-60.
4. Sodhani P, Gupta S, Jain S. A review of rare sites of detection of microfilariae in fine-needle aspiration smears. Diagn Cytopathol. 2002; 26(3):139-41.
5. Arora VK, Chopra R, Khurana N. Microfilariae in urine cytology: an unusual finding. Diagn Cytopathol. 2004; 30(6):411-3.
6. Rao RN, Bhat MR. Incidental detection of microfilariae in cytological smears: a review. Trop Parasitol. 2011; 1(1):71-2.
7. Kumar N, Kishore S, Saxena R, Rathi M. Unusual finding of microfilaria in urine cytology. Indian J Pathol Microbiol. 2015; 58(1):98-100.

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