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Original Research Article

Endometrial patterns in abnormal uterine bleeding

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Abstract

Background: Abnormal uterine bleeding is the direct cause of significant health burden for women. Examination of endometrial biopsy is a challenge to pathologists, due to wide range of morphologic patterns.
Aims and objectives: The present study was undertaken in cases of abnormal uterine bleeding and to correlate it with the clinical condition.
Method: A total of 212 cases were included either by endometrial curettage or hysterectomy.
Results: Major age group was 40-49 years. Menorrhagia was the commonest bleeding pattern. DUB was the largest group as regards the clinical diagnosis. Overall proliferative endometrium was the commonest histopathological picture also it was the commonest picture of patients presenting with different bleeding patterns except of postmenopausal bleeding where atrophic endometrium was the commonest histological picture. Consistency rate between curettage and hysterectomy was 56.25%.
Conclusion: Abnormal uterine bleeding is a common debilitating in women. Correct and timely diagnosis is necessary and specially to rule out cases of hyperplasia and carcinomatous focus for proper and timely management of patients.
Keywords: Abnormal uterine bleeding, endometrial curettage, proliferative endometrium, secretory endometrium

1. Introduction

Abnormal uterine bleeding is one of the commonest complaints leading to endometrial sampling by biopsy or curettage. AUB may be defined as bleeding patterns that differs in frequency, duration and amount from a pattern observed during a normal menstrual cycle or after menopause [1]. The histopathological evaluation to aid in diagnosis and further management cannot be over emphasized especially in premenopausal females who are at a risk of developing malignancy. AUB may be due to structural or functional causes. [2]

The larger group of functional disorders called as DUB can only be diagnosed after exclusion of structural iatrogenic medications, psychological and systemic disorders by various diagnostic techniques [3]. DUB can occur at any time in a woman's reproductive period and it needs careful and immediate assessment. When it occurs in older age group a rare meticulous screening for malignancy is imperative.

1.1 Aims & Objectives:

1) To study endometrial curettage & hysterectomy specimen in abnormal uterine bleeding.
2) Histopathological correlation of endometrium with clinical conditions.
3) To compare finding of endometrial curetting with hysterectomy specimen, wherever possible.

2. Material and Methods

In the present study endometrium from a total of 212 patients with abnormal uterine bleeding was collected in the form of dilatation and curettage (D & C), as endometrial biopsy or hysterectomy specimen.

Detailed clinical history and relevant investigations reports were recorded by interviewing the patient, from history sheet and old records.

A Total of 700 specimens were received during this period.

Patients having history of amenorrhea & having pregnancy were excluded.

Out of 700, 232 (33%) presented with abnormal uterine bleeding out of which 212 were chosen.

Rest 20 excluded due to: Inadequate material autolysed or necrosed specimen improper technique of collection (endocervix, blood and mucus only) inadequate fixation

Out of 212, 90 were endometrial curettage and 122 were Hysterectomy specimens.

The endometrium from either biopsy or hysterectomy specimen was processed and H & E staining done.

3. Observation

During the period of study, a total number of 232 cases with history of abnormal uterine bleeding (without previous history of amenorrhea or suspected pregnancy) were received. Of these 212 cases were chosen, rest were not included due to inadequate material, autolysed or necrosed specimen improper technique of collection and inadequate fixation.

Table: 1 Distribution of cases according to age

Age Group	No. of cases	%
9-19	1	0.47
20-29	20	9.43
30-39	69	32.55
40-49	70	33.02
50-59	29	13.68
>60	23	10.85
	212	100

The majority 70 cases (33.02%) belonged to the age group 40-49 years, followed by 69 cases (32.55%) of 30-39 years, 29 cases (13.68%) of 50-59 years, 23 cases (10-58%) to the age above 60 years, 20 cases (09.43%) were in the age group 20-29 years and only 1 case (0.47%) to the age group 9-19 years. (Table-1)

Table – 2: Type of bleeding

Type of bleeding	No. of cases	%
Menorrhagia	82	38.68
Metrorrhagia	24	11.32
Polymenorrhoea	27	12.74
Polymenorrhagia	19	8.96
Continuous bleeding	08	3.77
Postmenopausal bleeding	52	24.52
Miscellaneous		
	212	100

Of different varieties of bleeding patterns, menorrhagia was the most prominent (38.68%) presenting symptom. Others were postmenopausal bleeding (24.52%), polymenorrhoea (12.74%), metrorrhagia (11.32%), polymenorrhagia (8.96%) and continuous bleeding (3.77%) (Table – 2)

Table- 3: Clinical Diagnosis in abnormal uterine bleeding

Clinical diagnosis	No. of cases	%
Fibroid	62	29.25
DUB	112	52.83
Endometritis	17	8.02
Endometrial polyp	10	4.72
Endometrial carcinoma	02	0.94
Associated condition		
Carcinoma cervix tumor	03	1.42
	06	2.83
Total	212	100

Cases with no obvious gross pathology were observed by the surgeons, were labeled as DUB and were sent for histological assessment. It was the single largest group (52.83%) as regards the clinical diagnosis is concerned. Fibroid, constituted the second largest group (29.25%) 17 cases (8.02%) as endometritis, 10 cases (4.72%) as endometrial polyp and 2 cases (0.94%) as endometrial carcinoma.

Table-4: Histological status of endometrium

Histological status	No. of cases		%
Proliferative	62		29.25
Secretary	31		14.62
Biphasic	04		1.89
Menstruating	07		3.30
Hyper plastic			
	Simple	24	11.32
	Complex	15	7.08
	Cystic glandular	3	1.42
	Atypical	2	0.94
Malignant	Endo ca	2	0.94
Other	Endometritis	17	8.02
	Endometrial Polyp	10	4.72
	Decidual reaction	01	0.47
	Atrophic	20	9.43
	Cystic atrophy	14	6.60
Total		212	100

Histopathological picture of normal proliferative endometrium was obtained is 62 cases (29.25%) .out of these early proliferative endometrium was seen in 40 cases (64.54%), mid proliferative in 18 cases (29.03%) and late proliferative in 4 cases (6.45%).

Secretary endometrium was observed is 31 cases (14.62%) with 8 cases (25.80%) as early secretary activity and 23 (74.19%) as late secretary changes. Biphasic endometrium was seen in 4 cases (1.89%). 7 cases showed menstruating endometrium.

44 cases showed hyper plastic changes. Of all the cases of hyper plastic endometrium, 24 cases (54.54%) showed simple, 15 cases (34.09%) showed complex, 3 cases (6.81%) showed cystic glandular and 2 cases (4.54%) showed atypical hyperplasia.

2 cases of endometrial carcinoma (0.94%) was noticed during the study.

Endometritis could be diagnosed microscopically in17 (5.02%) cases, endometrial polyp in 10 cases (4.72%), decidual reaction in 1 case (0.47%), atrophic endometrium in 20 cases (9.43%) and cystic atrophy in 14 cases (6.60%).

Table 5: Correlation of clinical presentation with histological diagnosis

Histopathological Diagnosis	No. of cases	Meno. (82)	Met. (24)	Polymenorrhoea (27)	Polymenorrhagia (19)	Continuous Bleeding (8)	Postmenopausal bleeding (52)
Proliferative	62	27 (32.93)	5 (20.83)	13 (48.15)	4 (21.05)	1 (12.5)	12 (23.08)
Secretary	31	15 (18.29)	6 (25)	3 (11.11)	2 (10.53)	1 (12.5)	4 (7.69)
Biphasic	7	3 (3.66)	2 (8.33)	-	1 (5.63)	1 (12.5)	-
Menopausal	4	2 (2.43)	1 (4.67)	1 (3.70)	-	-	-
Atrophic	20	2 (2.48)	1 (4.67)	1 (3.70)	-	-	16 (30.77)
Cystic atrophy	14	2 (2.46)	3 (12.3)	1 (3.70)	1 (5.63)	-	7 (13.46)
Hyperplastic	44	20 (24.39)	3 (12.5)	3 (11.11)	8 (42.11)	3 (37.5)	7 (13.46)
Endometrial polyp	10	6 (7.32)	-	2 (7.40)	1 (5.63)	1 (12.5)	-
Endometritis	17	4 (4.88)	2 (8.33)	3 (11.11)	2 (10.53)	1 (12.5)	-
Malignancy	2	-	1 (4.67)	-	-	-	5 (9.62)
Decidual Reaction	1	1 (1.22)	-	-	-	-	1 (1.92)
Total	212	82	24	27	19	8	52

Table–5 elaborates the correlation of symptoms with the histopathological diagnosis. Of all the cases of menorrhagia (82 case) proliferative endometrium was the commonest histopathological finding (27.93%) followed by hyper plastic endometrium which is in (20.39%) cases of menorrhagia. Secretary phase was seen in 15 (18.29%) cases.

Taking polymenorrhoea and polymenorrhagia into consideration (19+27=46 cases), the proliferative endometrium was seen in 17 cases (36.96%), hyperplasic endometrium is 11 cases (23.9%) and secretary endometrium is 5 cases (10.87%).

Endometrium from patients with postmenopausal bleeding (52 cases) showed atrophic endometrium of the uterus as the most common (30.77%) histopathological finding. Others were proliferative (23.8%), cystic atrophy (13.46%) and hyperplasic (13.46%) endometrium.

Table 6: Clinic pathologic correlation in abnormal uterine bleeding

Clinical diagnosis	*Histopathological diagnosis*											
	No. of cases	Proli	Secre	Menorrhagia	Biphasic	Hyper	Endo ca	Endometritis	Endo polyp	Decidual reaction	Atrophy	Cystic atrophy
		62	31	4	7	44	2	17	10	1	2	-
Fibroid	62	34	7	4	-	15	-	-	-		2	-
DUB	112	25	24	-	7	29	-	-	-	1	14	12
Endometritis	17	-	-	4	-	-		13	-	-	-	-
Endo polyp	10	-	-	-	-	-	-	-	10	-	-	-
Endo ca	2	-	-	-	-	-	2	-	-	-	-	-
Ca Cervix	3	-	-	-	-	-	-	-	-	-	3	-
Ovarian carcinoma	6	3	-	-	-	-	-	-	-	-	1	2

6 of ovarian tumor – 2 granulosa cell tumor; 1 serous Cystadenocarcinoma; 2 serous cystadenoma

Table 6 – illustrated, that out of 62 clinically reported cases of fibroid uterus, endometrial pattern showed hyperplasia in 15 (24.19%) cases. In 112 cases of Dysfunctional uterine bleeding (DUB), where no gross pathology could be identified clinically, normal endometrium (proliferative and secretary) was seen in 49 cases (43.75%) hyperplasia in 29 (25.89%) and cystic atrophy in 13.46%.

Clinically suspected cases were proved to be cases of TB endometritis by histopathology as well and moreover, features consistent with tuberculous endometritis.

6 specimens of ovarian tumor showed features of 2 granulosa cell tumor, 2 serous cyst adenoma, 1 mucinous cyst adenoma and 1 mucinous Cystadenocarcinoma of ovary respectively.

Table 7: Correlation of endometrial histopathology with the hysterectomy

Histopath from hysterectomy	Same type					Different type						
Histopathology from curettage	Simple	Compound	Atyp.	Proliferative	Secretory	Simple	Compound	Atypical	Inactive	Prol	Sec	Total
Simple hyperplasia	8	0	0	0	0	0	0	0	4	6	3	21
Complex hyperplasia	0	4	0	0	0	2	0	0	2	4	0	12
Atypical complex	0	0	1	0	0	0	0	0	0	0	0	1
Proliferative	0	0	0	9	0	0	0	0	0	0	0	9
Secretary	0	0	0	0	5	0	0	0	0	0	0	5
Total	8	4	1	9	5	2	0	0	6	10	3	48

In 48 cases studied, consistency rate between curettage & hysterectomy 56.25%

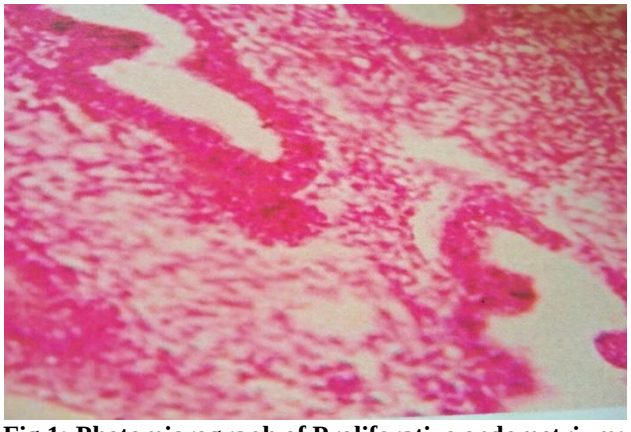

Fig 1: Photomicrograph of Proliferative endometrium: Tortuous glands lined by tall columnar epithelium with dense cellular stroma (H&E, 400X)

Fig 2: Photomicrograph of Early secretory endometrium: characteristic vacuoles with palisading nuclei (H&E, 400X)

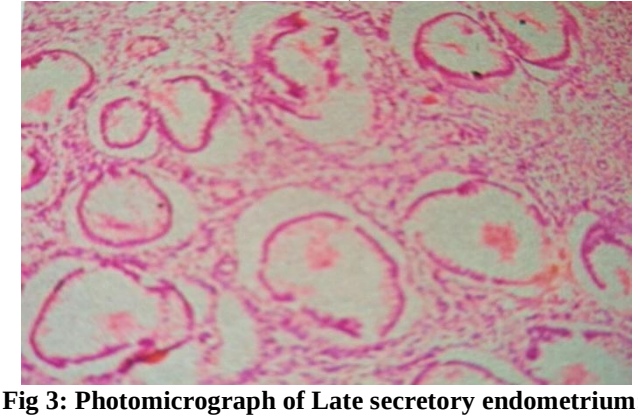

Fig 3: Photomicrograph of Late secretory endometrium: spiral arteriole with stromal edema (H&E, 100X)

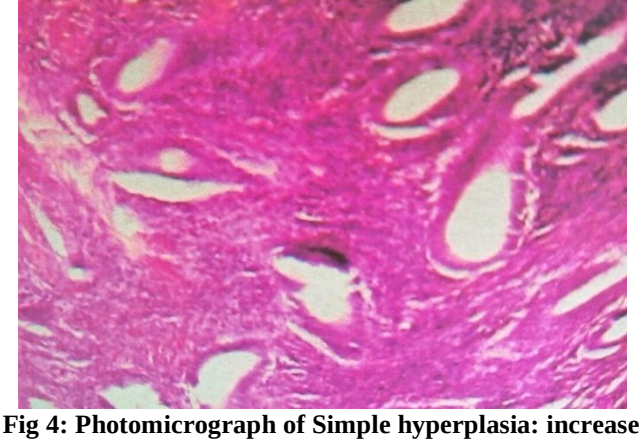

Fig 4: Photomicrograph of Simple hyperplasia: increase in the number of glands relative to the stroma (H&E, 100X)

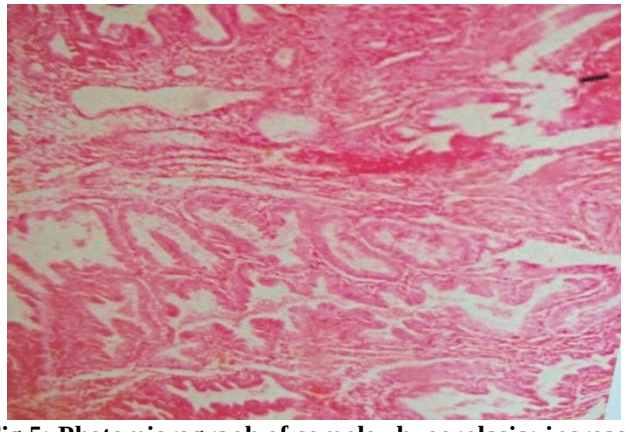

Fig 5: Photomicrograph of complex hyperplasia: increase in the number of glands relative to the stroma, glands is showing complex budding (H&E, 100X)

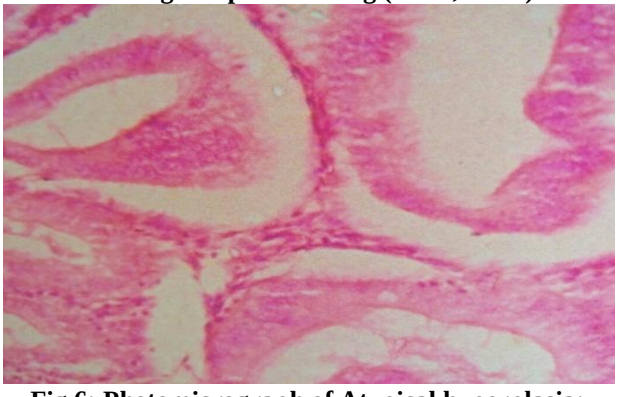

Fig 6: Photomicrograph of Atypical hyperplasia: overcrowding of the endometrial glands with back to back arrangement, mild degree of atypia is seen (H&E, 400X)

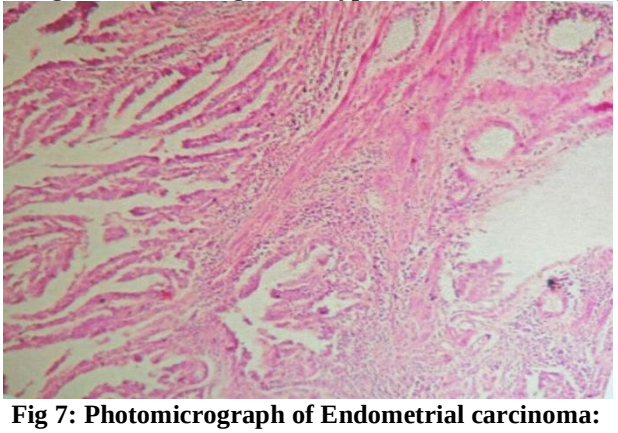

Fig 7: Photomicrograph of Endometrial carcinoma: extensive papillary pattern (H&E, 100X)

Fig 8: Photomicrograph of Endometrial polyp: endometrial glands are enlarged and cystically dilated. The lining epithelium is low columnar (H&E, 100X)

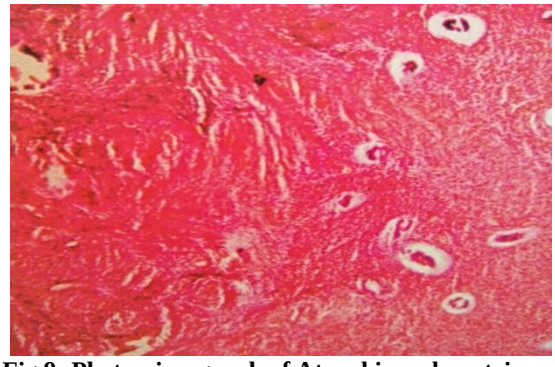

Fig 9: Photomicrograph of Atrophic endometrium: endometrium showing atrophic glands (H&E, 100X)

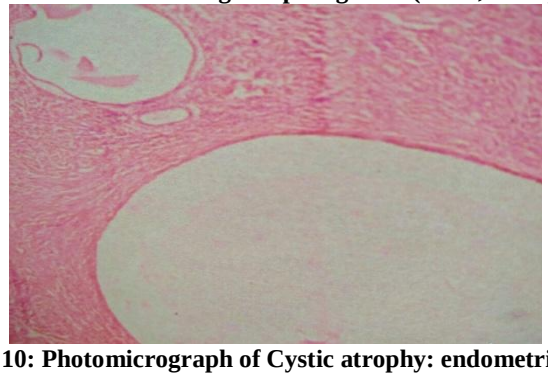

Fig 10: Photomicrograph of Cystic atrophy: endometrium showing cystically dilated atrophic glands (H&E, 100X)

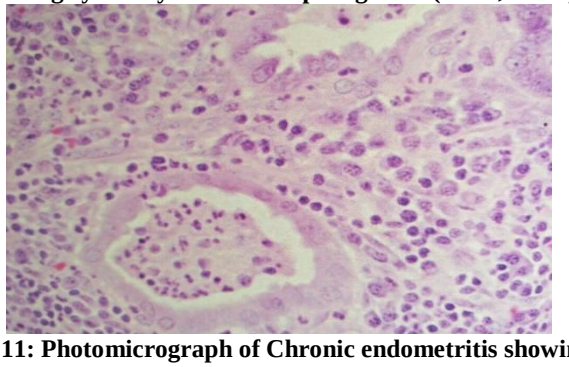

Fig 11: Photomicrograph of Chronic endometritis showing infiltration by lymphocytes and plasma cells: endometrium showing cystically dilated atrophic glands (H&E, 400X)

4. Discussion

Abnormal uterine bleeding is one of the most frequent complaints which compel a large number of female populations. The present study was done to understand the endometrial change that occurs is such cases.

During this study period of all the specimens (endometrial biopsies and hysterectomy specimens) received in the Department of pathology, 33% of cases were reported to have been suffering from abnormal uterine bleeding, This study is very much near to the findings of Mukherjee and Roychowdhury (1986)[4] and Pinto Rosario (1969)[5] who have observed an incidence of 24.7% of DUB among all the hysterectomies.

Of all the patients presenting with abnormal uterine bleeding 42.45% belonged to the age group below 40 years. Solapurkar[6] reported an incidence of 56.2% of patients under 35 years and Sanaullah Gozozai[7] observed an incidence of 56.1% below 40 years of age.

Of different varieties of bleeding pattern, menorrhagia was the most prominent (38.68%) presenting symptom which is comparable to study by Moghal N. (48%)[8] However, Pinto Rasaria[5] and Solapurakar[6] showed a low incidence of menorrhagia (26.3% and 25.9%)

A cooperative analysis of clinical presentation as reported by different authors has been shown in table 7.

Table 8: Comparative study of different studies done previously with the current study

Authors	Pinto Rosario [5] (1969)	Solapurkar M.L.[6] (1986)	Moghal N[8] (1997)	Zeebas[9] (2013)	Present study 2015
No. of cases studied	137	1084	458	638	212
Clinical presentations					
Menorrhagia	26.3%	25.9%	41%	41%	38.68%
Polymenorrhoea	-	10.1%	-	6.0%	12.74%
Metrorrhagia	12.4%	5.5%	48%	18.0%	11.32%
Cont. bleeding	50.4%	-	-	14.0%	3.77%
Post menopausal bleeding	-	8.0%	6.1%	3.0%	24.52%
Miscellaneous	10.9%	51.4%	-	14.0%	-

As regards the clinical diagnosis is concerned, DUB was found to be the largest group (52.83%) followed by fibroid (29.25%) and endometrial polyp (4.72%) Solapurkar[6] noted the overall incidence of DUB as 44.1% while Sarfaraz[10] observed fibroid in 48% of cases Sarin (reported) 3.5% polyp in his study while Sarfaraz[10] found the incidence of 8.0% of all cases.

In our study 43.87% cases, normal endometrial was noticed with proliferative endometrium in 29.25% and secretory endometrium in 14.62% other studies as Mirza *et al*[12] (57% and 35.0.8%) Sanaullah Gozozai *et al*[7] (74%) 31% Pinto Rosario *et al*[2] (49.6% and 35%) found comparable results.

Hyperplastic endometrium was observed is 27.54% of cases. Mirza *et al*[12] found in 30% Gozozai *et al*[7] in 11% and Sutherland [13] in 39.4% of all cases the commonest lesion simple hyperplasia was found in 54.54% cases of hyperplasia.

Simple hyperplasia is the term used where the glands are cystically dilated with occasional out perching and are surrounded by abundant stroma.

In 3 cases of cystic hyperplasia, the glands were in the secretary phase with decidual reaction in the stroma. Such a lesion cystic hyperplasia with full secretary activity could be the result of secretary effect super imposed on a previously hyper plastic endometrium and seen in either as treated case with progesterone which may convert the hyper plastic endometrium to full secretary endometrium or due to an ovulatory cycle followed by repeated anovulatory cycles in our study there was no evidence of any hormonal therapy, hence this endometrium represented the picture of endometrium having anovulatory cycles being terminated by an ovulatory cycle.

Atypical hyperplasia was seen in 2 cases (.94%) this is characterized by up increase in the number of glands lined by cells displaying cytological atypia. The glands have irregular outlines with back to back arrangement showing structural complexities. The more atypical the hyperplasia, the greater the chance that the patient will develop carcinoma subsequently. Thus one has to specify the degree of architectural and cytological atypia that are present. In cases of severe degree of atypia, hysterectorny showed be suggested in the report, because at times carcinoma is associated with atypical hyperplasia. [14]

All ambiguous terms such as cystic hyperplasia, adenomatous hyperplasia, premalignant lesion and adenocarcinoma in site should not be used but should be repaved by modifiers that indicate the extent of proliferation i.e. minimal, moderate or severe atypia.

When there is dysynchrony between the cytological and architectural abnormalities, it is better to grade hyperplasia on the basis of the cytological atypia rather than on architectural abnormalities [15]. Endometrial hyperplasia is considered as the morphological expression of prolonged estrogenic stimulation. Hendrickson and Kempson 1987[16] scully 1982[17] case of mild and moderate atypia can be treated by curettage or removed of estrogen source whereas severe atypia should be treated by hysterectomy. It should be kept in mind that only atypical endometrial hyperplasia are clearly associated with the subsequent development of carcinoma. [18]

In the present series, endometrial carcinoma was found in 0.94% of cases Solapurkar[6] reported 0.6% Mirza 2% cases as endometrial carcinoma.

Adenocarcinoma should always be graded as the prognosis and therapy depends much upon the degree of differentiation. [18-20]

In our study, endometritis was found in (17/122) 0.02% of all the cases. Out of these 17 cases, 11 cases were belonged to premenopausal or reproductive age group (64.70%) (11/17). Out of these 17 cases, only 4 cases (23.52%) show tubercular endometritis. Mirza [12] found 13% cases as endometritis. While Tyagi *et al*[21] reported TB endometritis in 1.08% cases.

Polyp may be difficult to recognize in curettage specimens. In our study polyp were found in 10 cases (4.72%) Jovicevic[22] found 2.6% Patra and Qiri [9,23] 6% and Solapurkar[6] 1.2% cases of polyp in their study. Polyp should appear as polypoid shaped fragments of tissue with epithelium on both sides. Histologically, irregular endometrial glands, or fibrous stoma and thick walled blood vessels are found.

Decidual reaction was found in 1 case (0.47%). Sarin *et al* [11] found 2.4% cases.

Atrophic endometrium was present in 20 cases (9.43%) of present study.

While correlating the clinical diagnosis with the histological findings, among those presenting with menorrhagia, normal endometrium was found in 53.65% cases (proliferative 32.93%), secretary 18.29% and hyperplastic in 29.9% cases. Patra and Qiri[23] reported normal and hyperplastic endometrium in 70% and 6.6% respectively.

Out of 122 hysterectomies, adenomyosis and leiomyoma and was noticed in 52 (42.62%) and 20 cases (16%) respectively.

Consistency rate between curettage and hysterectomy specimen in present study was 56.25% (27/48) which is comparable to study by Jesadapatrakul (43.1%)[24].

5. Conclusion

Hence it is recommended that the histological examination of the endometrium is must in cases of abnormal uterine bleeding so as to exclude the cases of hyperplasia, particularly atypical hyperplasic and carcinomatious focus in a hyperplastic endometriun which may need hysterectomy and further treatment.

References

[1] Ely J.W. Kennedy C.M, Clark E.C. Bwdler N.C. Abnormal uterine bleeding A management Algorithm. *J Am board fan Med* 2006; 19: 590-602.

[2] Muzzafar M, Akhtar KAK, Yasmin S, *et al* Menstrual irregularities with excessive blood loss. A clinico – pathological correlation. *JPMA* 2005; 55: 486.

[3] Albers JR, Hull S.K. Wesely R.M, Abnormal uterine bleeding. *Am Fan Physician* 2004; 69(8):1951-6.

[4] Mukerjee J. Roy Choudhary, NN. A review of 70 cases of Puberty menorrhagia. *J Obstet. Gynaec.* India, 1986; 36(1): 121.

[5] Pinto Rosfi irio, Y. Dysfunctional uterine bleeding in the postmenopausal age (A review of 137 cases) *J. Obstet. Gynaec.* India 1969; 19(5): 606.

[6] Solapurkar, M.U. Endometrial Spectra in women at different ages. *J. Obstet. Gynaec. India* 1986 36(1):139.

[7] Gozozai S, Bugti QA, Siddiqua A and Ehsan N, Excessive uterine hemorrhage A Histopathological study. *Gomal Journal of Medical Sciences* 2004; 2 (1):13-5.

[8] Moghal M. Diagnostic value of endometrial curettage in abnormal uterine bleeding. A histopathological study. JPMA, 1997 Dec 47 (12): 295-9.

[9] Zeeba S, Jairajpuri, S. Rana and S. Jetley. Atypical uterine bleeding-Histopathological audit of endometrium; *Al Am Een J Med Sci* 2013; 6(1):21-28.

[10] Sarfaraz T, Tariq H. Endometrial biopsy findings in postmenopausal bleeding. *Pak J Pathol* 2007; 18 (1):4-6.

[11] Sarin A.R, Singlla P, Gupta S.K. A S year clinico pathological study of 2000 postmenopausal women from Northern India, *Asia Oceania J. Obstet Gynaecol*. 1985; 11 (1): 639.

[12] Mirza, T. Abran S, Mirza A. Aziz Mirza T and Bustansar T; Histopathological pattern of abnormal uterine bleeding in endometrial biopsies, *J of Basic and Applied Sciences*, 2012; 8.114.

[13] Sutherland, A.M. (1949) Glasgow Med J 30:303, as quoted by DM Whurstf J. (1981), Integrated Obstetrics and Gynecology for postgraduates, 3rd *et al* London Black well Scientific Publication, p-679.

[14] Kurman, R.J. and Marries H.J. Evaluation of criteria for distinguishing atypical endometrial hyperplasia from well differentiate carcinoma. *Cancer*. 1982 Jun 15; 49(12):2547-59.

[15] Cogran TJ. Marries U.S. Foster and Kurman R.J. Predicting the outcome of endometrial hyperplasia by quantitative analysis of nuclear features using a linear discriminate function. *Int. J. Gynaecol Pathol* 1983; 15:1347.

[16] Kempson, R.L. and Hendrickson M.R. The female reproductive I 2nd, ed. Philadelphia J.B. Lippincott company.

[17] Scully R.E. (1981) definition and precursors in gynecologic cancer. *Cancer* 1988; 48: 531.

[18] Baral R, and Pudasaini S, Histopathological pattern of endometrial samples abnormal uterine bleeding *J. of Patho of Nepal* 2011; 1.13.

[19] Berman M.L. Ballon S.C. Lagasse L.D. Watring W.G. Prognosis and treatment of endometrial cancer. *Am J. Obstet Gynaecol* 1980; 136:679.

[20] Eifel, P Hendrickson M. Roa J, Ballon S. Simultaneous presentation of carcinoma involving the ovary and the uterine corpus. *Cancer* 1982; 50:163.

[21] Tyagi S.P. Ashraf N.I. Abbasi N. Prasad M Mohsin S. Endometrial tuberculosis; A histopathological study of 100 cases *J. Obstet. Gynaecol India* 1977; 27:935.

[22] Jovicevic C.V. Ciri C.J. Ciri C.B. Histopathological evolution of the endometrium in premenopausal bleeding mad. *Pregl.* 1989; 42(11-12):461.

[23] Patra D.C. Qiri A.K. Clinicopathological study of menorrhagia *Journal of Indian Medical Association* 1986; 81(10): 344.

[24] Somneuk Jesata Patrakul, MD Siriwan Tangjiganol, Sumonmal Manusirivitay. Histopathological consistency between endometrial hyperplasia and clinical diagnoses. *J Med Assoc. Thai* 2005; 88, Suppl. 2, 2