

# INTRAUTERINE CONTRACEPTIVE DEVICE-NUCLEI AND NUCLEOLAR STUDY OF THE ENDOMETRIAL GLANDS AFTER THREE YEARS OF USE

by

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## Introduction

Intrauterine contraceptive devices are being extensively used all over the world. Histological and histochemical methods have been employed to study the local endometrial alterations with IUCD as to have an insight into its mode of action.

The present study was undertaken to find out any nuclear or nucleolar changes associated with the use of Lippes loop.

## Material and Methods

Endometrium was procured from 38 cases who had the device for three years and from 13 normal fertile women of the same age group taken as control. Paraffin sections were stained by methyl green pyronin Y technique. Alternate sections were stained by Grocott's tetrachrome method. The number of nucleoli in one hundred nuclei was counted. Nuclear and nucleolar size was measured using a filar eyepiece micrometer.

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## Results

The age and parity of the IUCD users taken for the study is shown in Table I. The histological pattern in relation to the menstrual cycle is shown in Table II. Two specimens showed endometrial hyperplasia, the nucleolar studies of which have been tabulated along with the results of proliferative phase. Size of the nuclei and nucleoli and also the number of nucleoli is given in Tables III & IV (Figs. 1, 2, 3, 4).

The observations on nuclear and nucleolar variability of gland epithelial cells of the control were compared with those of IUCD (Table V). The endometrium without the device showed increase of nucleolar number during the proliferative phase and with IUCD the increase was during the secretory phase. The mean nucleolar size ratio during the proliferative and secretory phases was 1.36:1.38, respectively in the control and 1.40:1.41 respectively with IUCD.

Normally, under hormonal influence there is higher RNA content of the cell during the proliferative than the secretory phase. Abundance of RNA is reflected by increased nucleolar activity as indicated by larger and more multiple nucleoli. Nucleolar biometric studies have been carried out by various

TABLE I  
Showing the Age and Parity of IUCD Cases

Age group years	Number of cases	P A R I T Y				
		1	2	3	4	5
16-20	1	-	1	-	-	-
21-25	9	2	3	3	1	-
26-30	21	1	4	6	1	9
31-35	7	-	-	2	1	4
Total	38					

TABLE II  
Showing the Menstrual Pattern and Endometrial Status With IUCD

Duration of cycle days	Number of cases	Proliferative	Secretory	Endometrial hyperplasia
15-20	3	2	1	-
21-24	5	4	1	-
25-28	13	6	6	1
29-31	16	3	7	1
Continuqus bleeding	1	1	-	-
Total	38			

TABLE III  
Showing the Size of the Nuclei and Nucleoli as Also the Number of Nucleoli in Relation to  
Duration of Menstrual Cycles During the Proliferative Phase in IUCD

Duration of cycle days	Number of cases	Mean nuclear size in microns	Mean nucleolar size in microns	Number of nucleoli per nucleus (%)			
				1	2	3	4
15-20	2	8.29 x 3.94	1.4	60.5	36.0	3.5	-
21-24	4	7.70 x 4.50	1.4	37.6	47.7	14.0	0.7
25-28	6	7.64 x 4.30	1.4	49.6	42.0	7.0	1.4
29-31	8	8.00 x 4.10	1.4	55.2	37.0	7.4	0.4
Continuous bleeding	1	8.00 x 4.50	1.4	52.0	42.0	5.0	1.0

TABLE IV  
Showing the Size of the Nuclei and Nucleoli as Also the Number of Nucleoli in Relation to  
Duration of Menstrual Cycle During the Secretory Phase in IUCD

Duration of cycle days	Number of cases	Mean nuclear size in microns	Mean nucleolar size in microns	Number of nucleoli per nucleus (%)				
				1	2	3	4	5
15-20	1	7.4 x 4.7	1.4	67.0	30.0	3	-	-
21-24	1	7.2 x 3.9	1.4	55.0	39.0	4	1.0	1
25-28	7	7.8 x 4.3	1.4	44.0	41.5	12	2.0	0.5
29-31	8	8.1 x 4.7	1.42	47.6	42.6	8	1.5	0.3

TABLE V  
Showing Comparison of Nucleolar Biometry Data Between Normal and IUCD

Phase of the cycle	Number of cases	Mean nucleolar size in microns	Mean of nucleolar size in microns	Number of nucleoli per nucleus (%)			
				1	2	3	4
I. Normal cases	13						
Proliferative	8	7.14 x 4.5	1.36	69.9	22.1	6.8	1.2
Secretory	5	8.10 x 4.4	1.38	84.0	15.0	6.9	-
II. IUCD cases	38						
Proliferative	21	9.9 x 4.2	1.40	83.5	15.1	1.4	-
Secretory	17	7.6 x 4.4	1.41	82.2	14.5	2.3	0.9

workers to show the change from non-malignant to a malignant condition. Novak and Woodruff (1962) on the other hand, have not paid much importance to nucleolar size or the number and stated that it is of weak diagnostic significance since such a change can be observed in biological variant of non malignant cell undergoing secretion or regeneration.

The present work was carried out to study the local changes due to the presence of a foreign body and also to observe the long term effects of the device on the nuclear and nucleolar biometry.

The results of IUCD endometrium (Table VI) compare well with the results of normal series of Long *et al.*, (1958). As compared to the normal of present series there was an increase of the nucleolar number during the secretory phase. It is therefore suggested that for screening purposes the endometrium must always be studied after three years of use of the device and every year thereafter till the device is in situ. Regarding the mode of action of the device the study supports the view of asynchrony to some extent. The endometrium undergoes regenerative

TABLE VI  
The Percentage of Multiple Nucleoli per Nucleus in the Present Series and that of Long *et al.*, (1958)

Phase of the cycle	Number of nucleoli per nucleus (%)					
	1	2	3	4	5	6
Present series.						
1. Normal Group						
Proliferative		69.9	22.1	6.8	1.2	
Secretory		84.2	15.0	0.9		
2. IUCD Group						
Proliferative		83.5	15.1	1.4		
Secretory		82.2	14.5	2.3	0.9	
Long <i>et al.</i> , series						
1. Normal						
Proliferative		75.9	20.7	3.2	0.2	
Secretory		77.9	19.2	2.7	0.2	

changes like that of the proliferative phase even after ovulation whereby it is not fully receptive to the fertilized ovum for implantation.

during the postovulatory period whereby the endometrium is not receptive to the fertilized ovum.

Summary

The nucleolar number of the gland epithelial cells during the secretory phase was found to have increased with the presence of Lippes loop. Mean nucleolar size was also altered. A thorough endometrial study after three years of use of device is suggested. Regarding the mode of action of 'Loop', there appears to be 'asynchrony' of nucleolar RNA in favour of regeneration

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References

1. Long, M. E., Doko, F. and Taylor, H. C. Am. J. Obst. Gynec. 75: 1002, 1958.
2. Novak, Z. E. R. Woodruff, B. S.: Gynec. and Obst., Pathology, 1962 Vth/II edition, W. B. Saunders company, London.

See Figs. on Art Paper IV

*[Faint, illegible text, likely bleed-through from the reverse side of the page.]*

TABLE I

Group	Mean Nucleolar Number	Standard Deviation	Mean Nucleolar Size (μm)	Standard Deviation (μm)
Control	1.2	0.3	1.5	0.2
Loop	1.8	0.4	1.8	0.3
Control	1.1	0.2	1.4	0.1
Loop	1.5	0.3	1.6	0.2
Control	1.3	0.4	1.6	0.3
Loop	1.7	0.5	1.9	0.4