RESULTS

In the first group, controls 100 volunteers with no history of nasal disease 30 (30%) males and 70 (70%) females. Age ranged 20-60 (mean 38.1, standard deviation 10.6).

In the second group, cases 200 patients with chronic rhinosinusitis 84 (42%) males and 116 (58%) females. Age ranged 20-60 (mean 37.5, standard deviation 10.8).

	Control (100)	**Case (200)**	**X^2**	**P**
Sex				
Male	**30 (30%)**	**84 (42%)**	**4**	**<0.05**
Female	**70 (70%)**	**116 (58%)**		

Table 1: There is statistically significant difference between case and control for sex.

	Control (100)	**Case (200)**	**T**	**P**
Age				
Mean±SD	**38.1±10.6**	**37.5±10.8**	**-0.4**	**NS**
Range	**(20-60)**	**(20-60)**		

Table 2: There is no statistically significant difference between case and control for age.

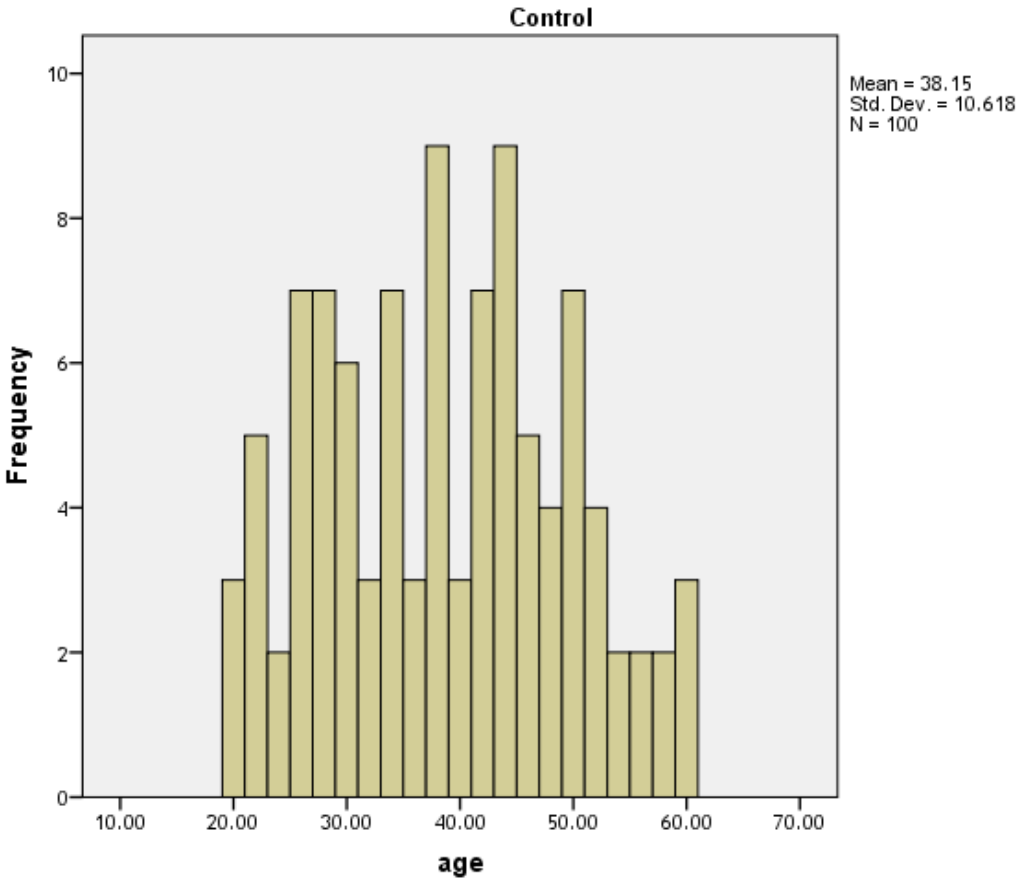

Figure 11: Incidence of age for controls.

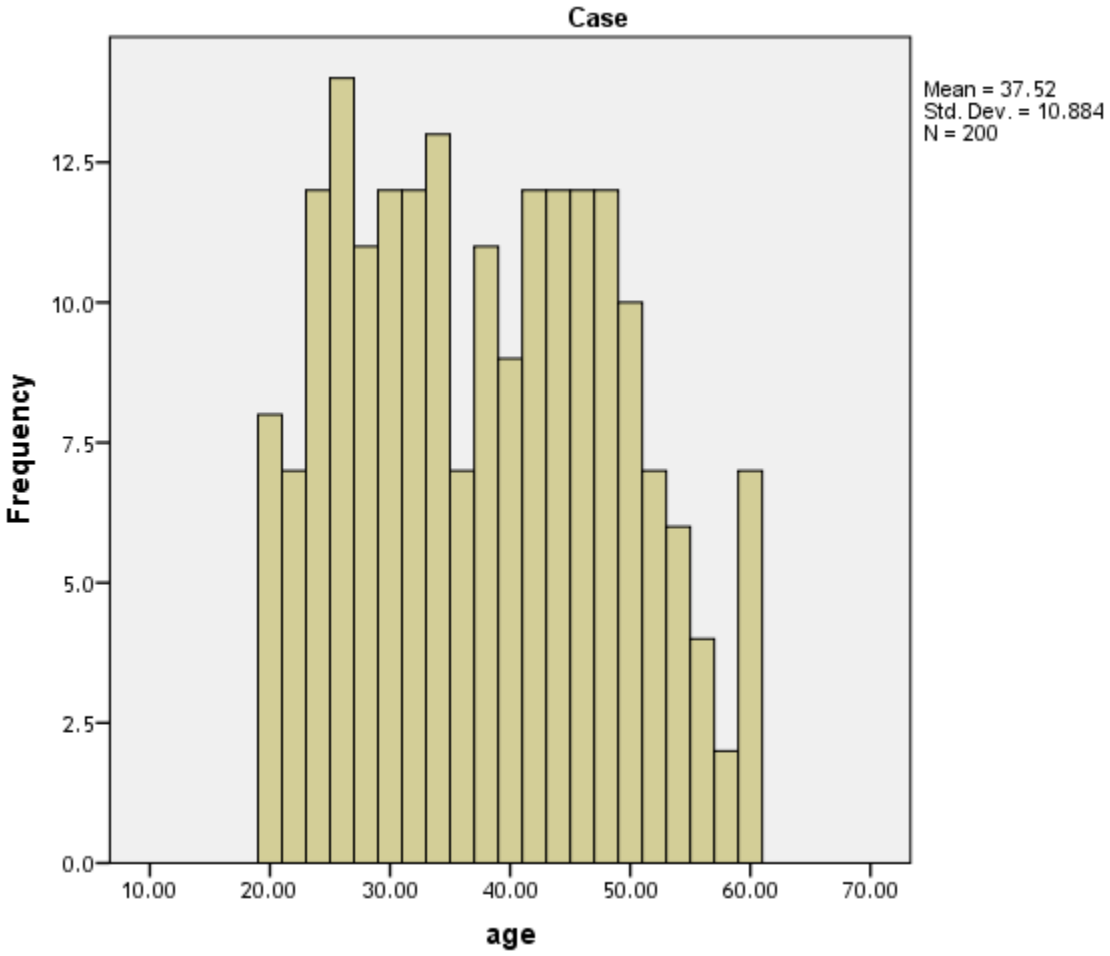

Figure 12: Incidence of age for cases.

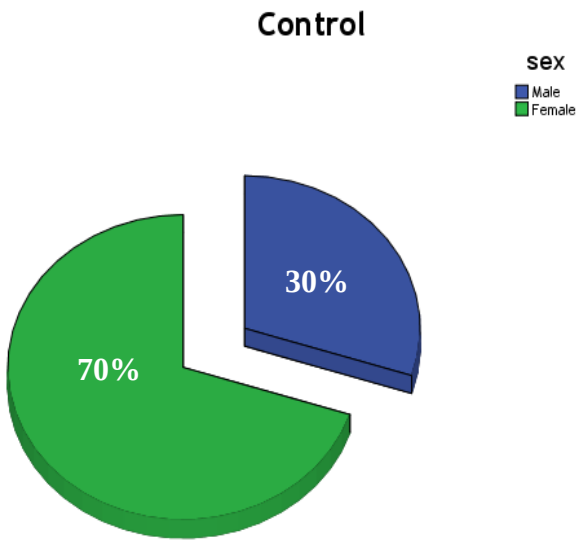

Figure 13: Male to female ratio for control.

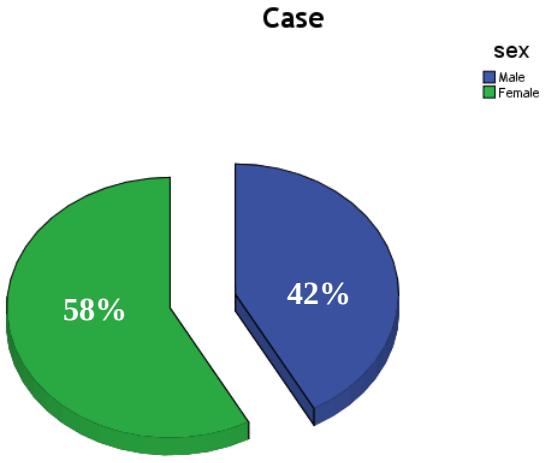

Figure 14: Male to female ratio for case.

In the first group (controls), after nasal examination by fiberendoscopy done; we found that defect in the fontanel area found in 5 (5%) patients (3 males and 2 females). The defect found in the posterior fontanel. No defect can be detected in the anterior fontanel. No multiple defects can be detected in the same patient. No defect in the fontanel area can be detected bilaterally.

In the second group (cases), after nasal examination by fiberendoscopy done; we found that defect in the fontanel area found in 30 (15%) patients (18 females and 12 males). The defect found in the posterior fontanel. No defect can be detected in the anterior fontanel. It was bilateral in 2 (1%) patients. No multiple defects can be detected in the same patient.

The results of the study indicate association between cases with CRS and presence of defect in the fontanel area detected in 15% of cases whereas controls with no history of nasal problems the presence of defect in the fontanel area detected in 5% of controls only which is much more less than cases. According to these results there is statistically significant difference between cases and controls in the presence of defect ($p < 0.05$).

			Control N=100	Case N=200	X^2	P
Defect	No defect	Count	95	170	6.6	<0.05
		%	95.0%	85.0%		
	Unilateral (posterior)	Count	5	28		
		%	5.0%	14.0%		
	Bilateral	Count	0	2		
		%	0.0%	1.0%		

Table 3: There is statistically significant difference between case & control in the presence of defect (association between CRS and presence of defect).

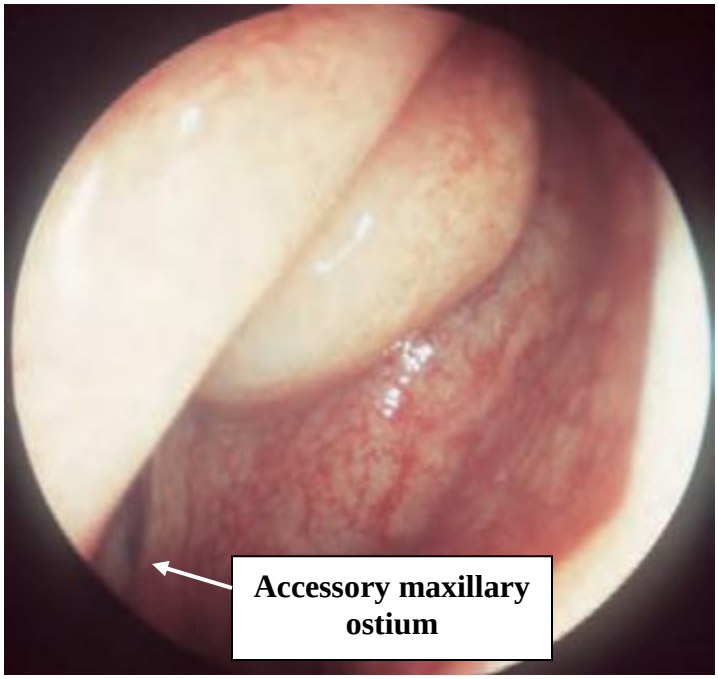

Figure 15: The uncinate process and the bulla ethmoidalis with an accessory ostium in the posterior fontanelle.

In the first group, NO mucus ring between maxillary natural ostium and the defect in the posterior fontanel can be identified.

In the second group, Mucus ring between maxillary natural ostium and the defect in the posterior fontanel can be identified in 4 (2%) patients (3 females and 1 male).

			Control N=100	Case N=200	X^2	P
Mucus Ring	No	Count	100	196	2	NS
		%	100.0%	98.0%		
	Present	Count	0	4		
		%	0.0%	2.0%		

Table 4: There is no statistically significant difference between case & control in the presence of mucus ring.

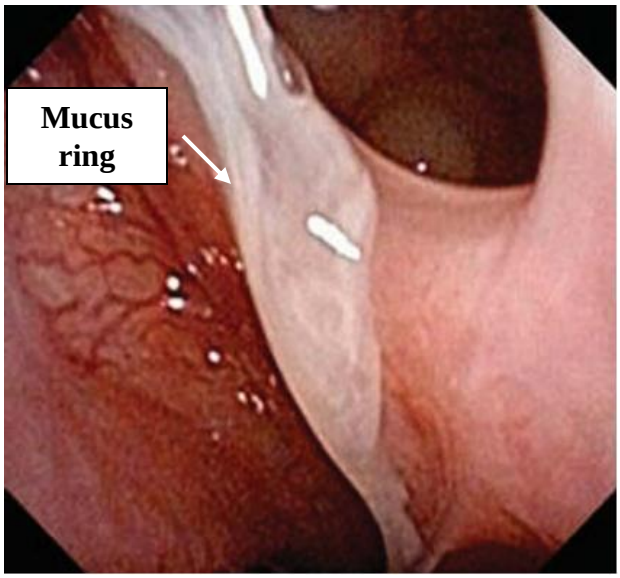

Figure 16: Left nasal cavity with mucus ring comes out from the defect of the posterior fontanelle.

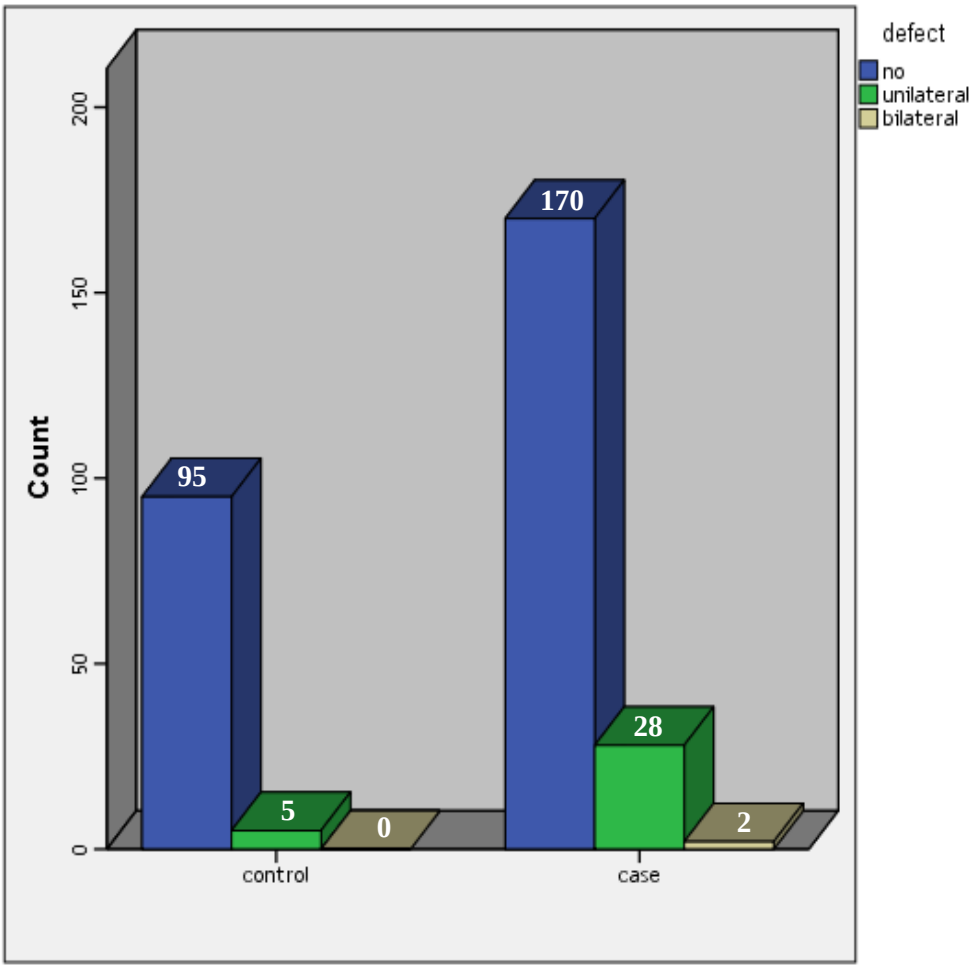

Figure 17: Number of individuals with fontanel defects (unilateral-bilateral) in both control and case groups.

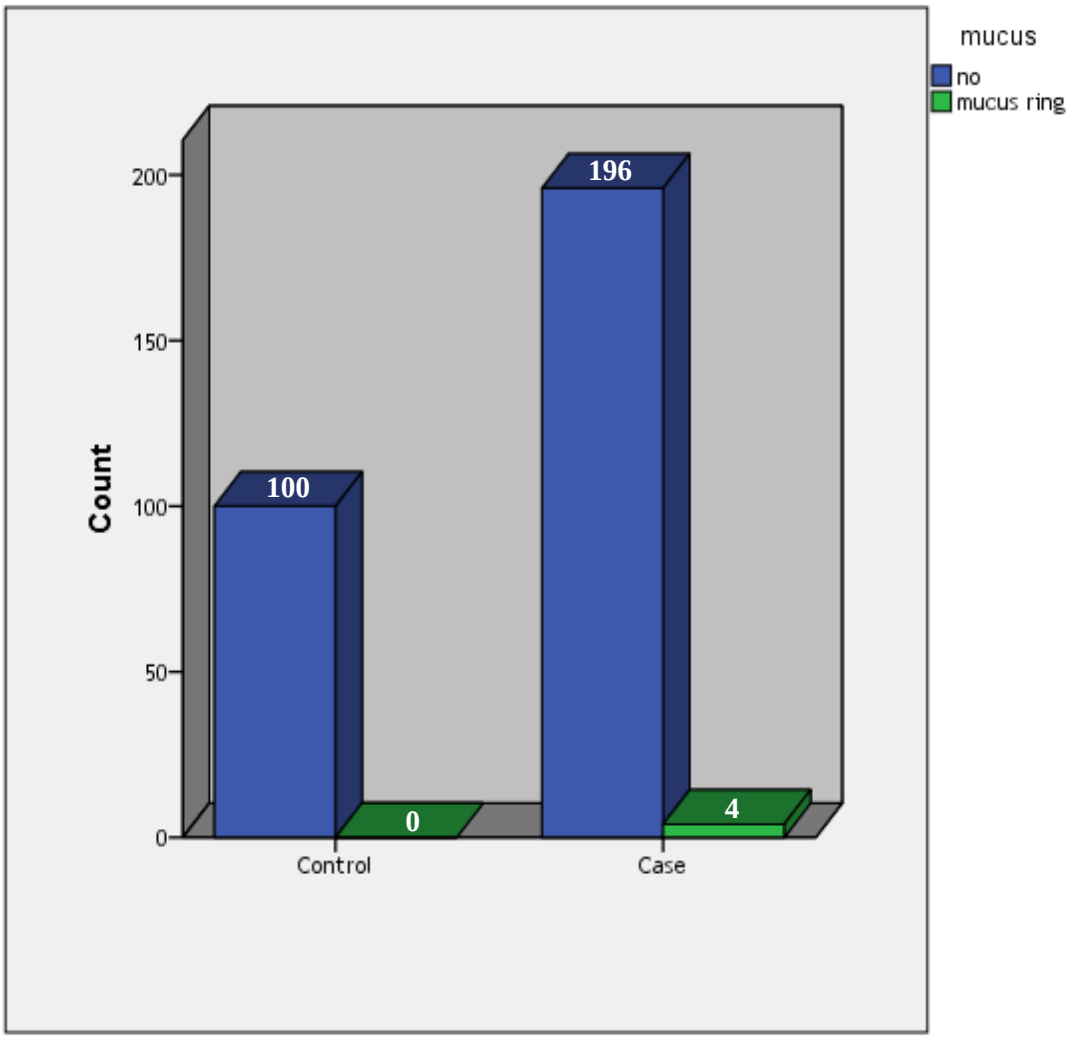

Figure 18: Number of individuals with mucus ring in both control and case groups.

Also, the results of the study indicate statistically highly significant association between presence of defect and presence of mucus ring for cases ($P < 0.001$). These results support that recirculation of mucus with formation of mucus ring has an important role in chronic inflammation of related maxillary sinus.

			Defect		Total	X^2	P
			NO	YES			
Mucus Ring	NO	Count	170	26	196	18.1	<0.001
		% within defect	100.0%	86.7%	98.0%		
	YES	Count	0	4	4		
		% within defect	0.0%	13.3%	2.0%		
Total		Count	170	30	200		
		% within defect	100.0%	100.0%	100.0%		

Table 5: There is statistically significant association between presence of defect and presence of mucus ring for cases.

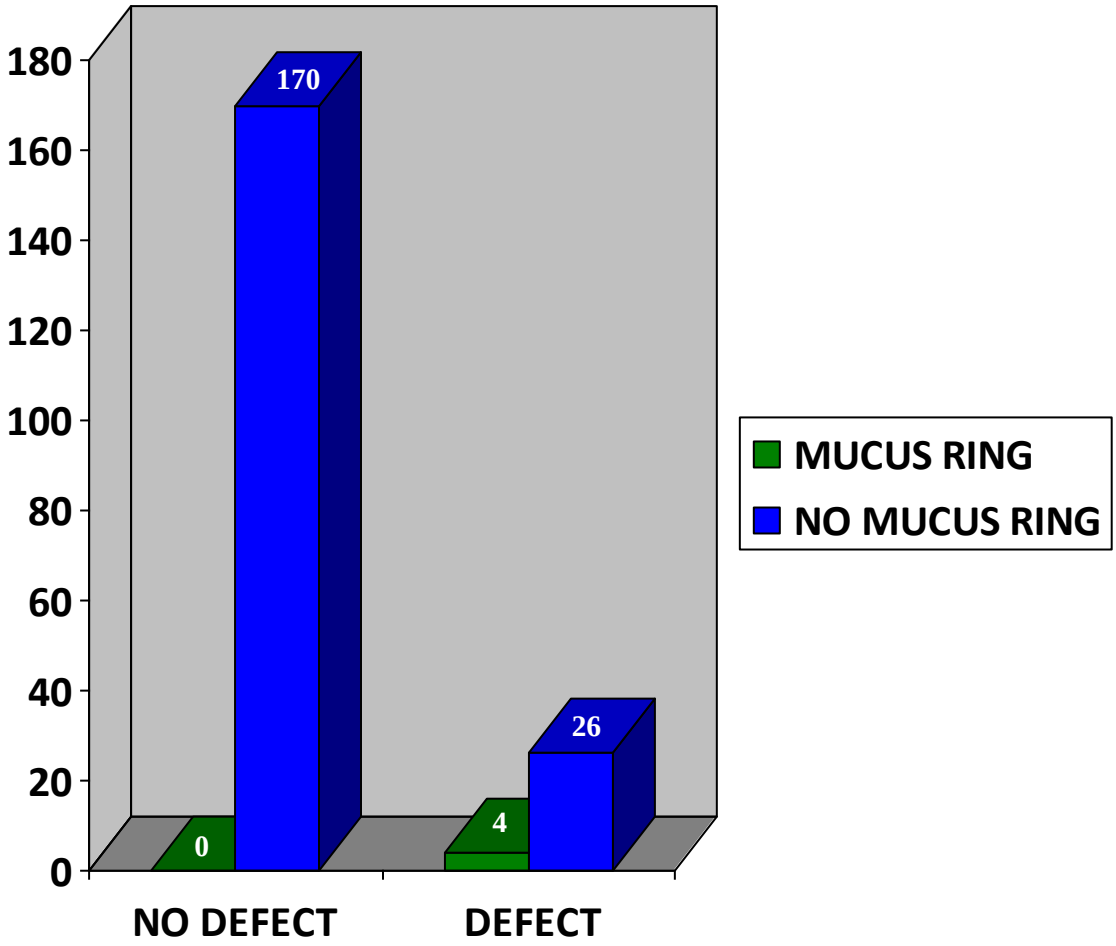

Figure 19: Cases with and without defect and mucus ring.

According to the results of the study there is no statistically significant association between sex and presence of defect for controls.

				Sex		X^2	P
				Male	Female		
Control	Defect	No	Count	27	68	2.2	NS
			%	90%	97.1%		
		Present	Count	3	2		
			%	10%	2.9%		
	Total		Count	30	70		
			%	100.0%	100.0%		

Table 6: There is no statistically significant association between presence of defect and sex for control.

According to the results of the study there is no statistically significant association between sex and presence of defect for cases.

				Sex		X^2	P
				Male	Female		
Case	Defect	No	Count	72	98	1.4	NS
			%	85.7%	84.5%		
		Present	Count	12	18		
			%	14.3%	15.5%		
	Total		Count	84	116		
			%	100.0%	100.0%		

Table 7: There is no statistically significant association between presence of defect and sex for cases.

According to the results of the study there is no statistically significant association between presence of mucus ring and sex for cases.

				Sex		X^2	P
				Male	Female		
CASE	mucus	NO	Count	83	113	0.4	NS
			%	98.8%	97.4%		
		YES	Count	1	3		
			%	1.2%	2.6%		
	Total		Count	84	116		
			%	100.0%	100.0%		

Table 8: There is no statistically significant association between presence of mucus ring and sex for case.