



FOCUS ON RESEARCH

DOES INTRA-ABDOMINAL FAT ACCUMULATION INDUCE INTRASPHINCTERIC ACID REFLUX AND METAPLASIA (CELLULAR CHANGES) AT GASTRO-OESOPHAGEAL JUNCTION?

Researchers

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Aim

Cancer of the junction between the gullet and stomach is increasing in incidence. It is more common in subjects with abdominal obesity. It is known that reflux of stomach acid up into the gullet can cause heartburn and damage to the gullet leading to cancer. This reflux occurs when the valve between the stomach and gullet fails. However, most cancers at the junction between the gullet and stomach occur in subjects without symptoms or evidence of acid refluxing across the valve into the gullet. The present study was performed to determine whether abdominal obesity might be causing stomach acid to reflux into but not right across the valve and produce changes within it likely to lead to cancer at this site.

Project Outline/Methodology

Our study involved 25 healthy volunteers with large waist circumference and 25 with small waist circumference. None had symptoms of heartburn. Using specially developed probes we performed detailed studies of the valve at the junction between their stomach and gullet and the ability of stomach acid to enter the valve area. We also studied the lining of this area for evidence of acid damage and changes leading to cancer.

Key Results

We found that there was evidence of penetration of stomach acid further into the valve in the group with abdominal obesity. In addition, we found that the lining showed changes of acid damage in that the lining of the gullet was transforming to resemble that of the stomach and this change is recognised to be associated with an increased risk of cancer. The subjects with increased abdominal obesity did not have evidence of traditional reflux of stomach acid up into the gullet associated with complete failure of the valve. We are naming this reflux of acid into the valve but not right across it as intra-sphincteric reflux (sphincter is the medical name for valve).

Conclusions

Our study has identified a novel disorder affecting the valve between the gullet and stomach and which can explain the high incidence of cancer at this site in subjects with abdominal obesity.

What does this study add to the field?

Prior to our studies, it was considered that damage to the gullet by acid refluxing from the stomach only occurred due to intermittent complete opening of the valve between the gullet and stomach. Our studies indicate such damage can occur by only the lower portion of the valve opening. This mechanism is much more common than reflux due to complete opening of the valve and is caused by abdominal obesity.

Implications for Practice or Policy

This study identifies an important role for central obesity in acid damage to the gullet and its complication of gullet cancer. It highlights the role of controlling central obesity in prevention of this cancer.

Where to next?

The following questions arise from our findings: (i) does the use of a waistband exert a similar mechanical strain on the valve between the stomach and gullet and represent a further environmental factor in the causation of gullet cancer? (ii) Does our finding explain the marked male predominance of gullet cancer? Males deposit fat around the upper abdomen whereas females deposit fat around the hips and the male pattern is the one that will produce the strain on the valve which we have observed. (iii) There is a need to further investigate the cancer potential of the changes we have observed in the lining of the lower gullet associated with abdominal obesity. (iv) Does this acid damage within the valve region produce symptoms?

Further details from

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