

# Obesity Markers as Predictors for Colorectal Neoplasia (J Obes Metab Syndr 2017;26:28-35)

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Colorectal cancer is the third most common cancer in Korea, and obesity has been closely related to not only colorectal cancer but also colorectal adenoma in many epidemiological studies.<sup>1-3</sup> According to the above systemic reviews, the obesity parameter of body mass index showed a significant relationship with colorectal adenoma but this was not a linear relationship, while the abdominal obesity index, weight circumference, revealed a dose response relationship with development of colorectal adenoma.

Kwon et al.<sup>4</sup> showed which type of obesity phenotype was a good predictor for colorectal neoplasia among 268 subjects. They also evaluated waist-to-height ratio's relationship with colorectal neoplasia and suggested that waist circumference and waist-to-height ratio could be better predictive markers than body mass index, especially in women. However, analysis of this finding needs to be considered more carefully. First, it was complicated by the difference in fat distribution according to the menopausal status in women. In premenopausal women, the anti-cancer effects of estrogen through regulation of gene transcription and modulation of cellular process involved in colorectal carcinogenesis has been seen, whereas those benefits are lacking in postmenopausal women.<sup>5</sup> Second, metabolic risks associated with abdominal obesity should be taken into account in relationship with colorectal neoplasia.

Several mechanisms have been suggested to explain obesity-associated colorectal cancer.<sup>6</sup> Insulin like growth factors (IGF) are expressed in the mucosal layer of the normal colon and insulin stimulates proliferation of cultured colonocytes and colorectal cancer cells directly by binding to IGF-receptors to activate signaling via direct or indirect pathways. Also, increased plasma levels of IGF-1 and hyperinsulinemia seemed to induce development of dysplastic crypt foci. Hyperlipidemia and hyperinsulinemia also lead to low grade systemic inflammation, which promotes tumor cell proliferation and angiogenesis and reduces apoptosis. Adipokines such as leptin and adiponectin could allow for establishment of a tumor microenvironment.

Recently, a study showed that visceral adiposity measured by computed tomography was strongly associated with colorectal adenoma not only in women, but also in men.<sup>7</sup> So, it could lead to bias if we only take anthropometric obesity phenotype into account and use it as a proxy for visceral fat. Therefore it would be efficacious to develop an obesity phenotype index that can be combined with metabolic factors such as blood pressure, glucose or triglyceride level for predicting colorectal neoplasia, because metabolic factors can affect visceral obesity-related dysregulation leading to carcinogenesis.

Further investigation into indices of visceral adiposity beyond

body mass index, waist circumference or waist-to-height ratio will be required for predicting obesity-related precancerous lesions or cancers.

### CONFLICTS OF INTEREST

The author declares no conflict of interest.

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