Background: Stromal cells are recognised to play a role in the progression to cancer; myofibroblasts are a key stromal component but their roles in Barrett’s oesophagus and oesophageal carcinogenesis are poorly understood. Aim: To determine the proliferative responses of OE33 cells and Barrett’s glands to conditioned media (CM) from oesophageal carcinoma-derived myofibroblasts (CAM), adjacent normal (ANM) tissue and normal oesophagus (NM), and to characterise the transcriptomes of these cells. Methods: [$^3$H]-thymidine and BrdU incorporation were used to study cell proliferation and transcriptomes were defined using Affimetrix GeneChip microarrays. Results: CAM exhibited increased proliferation compared to ANM, or NM (fold increase, 1.5±0.03). Barrett’s glands and OE33 cells exhibited 2.5-fold and 3.0-fold greater proliferation, respectively in response to CM from CAM compared with ANM. There was differential expression of 108 transcripts in CAM versus ANM and 309 versus NM (FC>1.5, p<0.05). Quantitative-PCR and Western blotting confirmed the changes in selected genes identified by gene array. Differentially expressed genes included those implicated in cell-cycle regulation. Conclusion: Altered expression of genes associated with cell-cycle control leads to increased proliferation of cancer-derived myofibroblasts and their increased ability to stimulate proliferation of Barrett’s glands and OE33 cells.