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A possible role of mesenchymal stem cells in age-related regression of cervical intraepithelial neoplasia

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High grade cervical intraepithelial neoplasia (CIN2) is a pre-cancerous lesion of uterine cervix that affects between 250,000 and 1 million of American women every year. CIN2 may either resolve spontaneously with a regression or degenerate in CIN3 requiring treatment by loop electrosurgical excision procedure-LEEP (conization). Several studies showed that CIN can occur at any age and the rate of a natural regression is more evident in young woman, around 65%, rather than in old woman, from 15 to 23% [1]. Recent researches are focusing on the involvement of inflammation in CIN progression to evaluate the use of anti-inflammatory drugs in the treatment of CIN [2]. It is known that in addition to the different cells of the immune system, mesenchymal stem cells (MSCs) are able to modulate an inflammatory process. The purpose of our study was to isolate MSCs from cervix of young (yC-MSCs) and old patients (oC-MSCs), in order to evaluate if age can affect their properties and immunobiology; since CIN may progress towards cervical cancer, indirect co-culture with HeLa cells were performed and the effects tested. Our results show that both oC-MSCs and yC-MSCs attain the minimun criteria for MSCs definition [3] even if oC-MSCs display a greater degree of senescence than yC-MSCs. Furthermore, yC-MSCs express higher level of cytokines related to acute inflammation than oC-MSCs. HeLa cells, in co-culture with oC-MSCs, produce an increase in the expression of genes referred to tumor development. In conclusion, the immunobiology of MSCs derived from cervix is affected by the age of donors and this can influence the regression rate of CIN through a paracrine effect. In addition, MSCs from young cervixes drive an anti-tumoral effect by sustaining an acute inflammatory environment.

References

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Key words

Inflammation, cervical intraepithelial neoplasia, MSCs, HeLa, cervix.