Stem cell-conditioned media aids the successful treatment of androgenetic alopecia (AGA) (2022)

Tawny A. Bolinas,[1] Allison Brewer,[1] Karla Garcia,[1] Abou Shahla,[1] Kristen Rueb,[2] and David Stachura[2]

[1] *Biological Sciences, California State University, Chico, Chico, CA, United States*
[2] *Biological Sciences, California State University, Chico, Chico, CA, United States*

Androgenetic alopecia (AGA) is a common form of hair loss that affects up to 50% of males between 18 and 40 years old. 80% of Caucasian men will experience some form of AGA before they reach 70 years of age. Testosterone is necessary for AGA to develop, and a genetic susceptibility locus in the androgen receptor is present in a minority of men with AGA. However, additional factors contributing to this disorder remain unknown. Many previous studies indicate that there are a multitude of molecules involved in the control of the hair cycle. Although not normally used to treat this condition, stem cell conditioned media (CM) from adipose-derived mesenchymal stem cells (ADMSCs) contains prostaglandins, cytokines, and anti-inflammatory proteins that are missing in AGA patients. For this reason, we believe that the CM will have a positive effect on hair growth. To perform this study, CM, the prostaglandin PGE2 (found in CM and linked directly to hair growth), minoxidil (which has an unknown method of action, but likely signals through PGE2), redensyl (has an unknown method of action), and the empty vehicle were used to see an effect on murine hair growth. A double-blind clinical trial was conducted with 10 mice (5 males and 5 females) per condition. Mouse bellies were depilated, and 25 μL of various treatments were applied daily to the ventral left side of the mice. Preliminary results indicate that all treatments somewhat accelerated hair growth, but the application of a combination of the factors worked the best to restore hair growth. While more studies need to be completed, it appears that stem cell-conditioned media and supplements caused significant hair growth in mice.