ECONOMIC EVALUATION OF INTEGRATING AN EPIGENETIC AND COMPREHENSIVE MALE INFERTILITY ASSESSMENT

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Background:
Male infertility affects 70 million men worldwide, yet the standard diagnostic tool—semen analysis—frequently fails to identify a significant number of subfertile men. This leads to undiagnosed male factor infertility, often resulting in female partners undergoing unsuccessful treatments such as intrauterine insemination (IUI). The Sperm Quality Test (SpermQT), a novel epigenetic analysis, provides a more comprehensive evaluation of sperm functionality, offering the potential to significantly improve reproductive treatment recommendations.

Objective:
To evaluate the economic impact of integrating SpermQT into the male infertility diagnostic process for patients, fertility clinics, and fertility benefit payers, using a combination of national treatment cost data and large-scale market research.

Materials and Methods:
An economic analysis was conducted using national average costs for fertility treatments, including initial consultations, semen analysis, IUI, in vitro fertilization (IVF), and intracytoplasmic sperm injection (ICSI). Market research data (n=59,312 treatment cycles) were used to incorporate patient drop-out rates, treatment recommendations, and success rates. Additionally, the cost and clinical outcomes data from the retrospective usage of SpermQT were integrated into the model. The analysis evaluated time and cost savings from the perspectives of patients, fertility clinics, and fertility benefit payers.

Results:
The analysis showed that payers could save $334 per covered life by reducing the number of unsuccessful IUI cycles, FIGURE 1. IUI treatments involve various costs, including medications ($30-$2,000), the insemination procedure itself ($100-$500), and follow-up monitoring ($500-$1,000 per cycle), FIGURE 1. By using SpermQT to identify men who are unlikely to benefit from IUI, payers avoid covering these expenses for those with an Abnormal result. Moreover, ordering SpermQT immediately after a semen analysis can help reduce the high dropout rates seen after three failed IUI attempts, as many couples opt out of further fertility treatments when IUI is unsuccessful. Providers also benefit from identifying previously unidentified subfertile men through cost optimization, as IUI-associated expenses include laboratory services, medical personnel, clinical equipment, and additional administrative tasks. By moving subfertile patients to IVF-ICSI earlier, SpermQT optimizes these costs for providers and enhances the efficiency of fertility treatment management.

Conclusion(s):
Incorporating SpermQT into the initial male infertility diagnostic workup provides significant economic benefits for all stakeholders. Patients experience cost and time savings, clinics

increase profit margins, and fertility benefit payers reduce unnecessary spending on ineffective treatments. SpermQT represents an important advancement in the comprehensive evaluation of male fertility, leading to more personalized and effective reproductive treatment pathways.

FIGURE 1