



SMART DENTAL UPDATES

Dear Doctor,
Greetings from Micro Labs Limited. We are happy to bring you “**SMART DENTAL UPDATES**” which contains latest and interesting news in the field of Dentistry.
This issue contains

- Global, Regional Trends in Burden of Oral Conditions
- Efficacy and Safety of Articaine in Pediatric Practice
- Addition of Different Nanoparticles on Poly(methylmethacrylate) Denture Base Material

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,

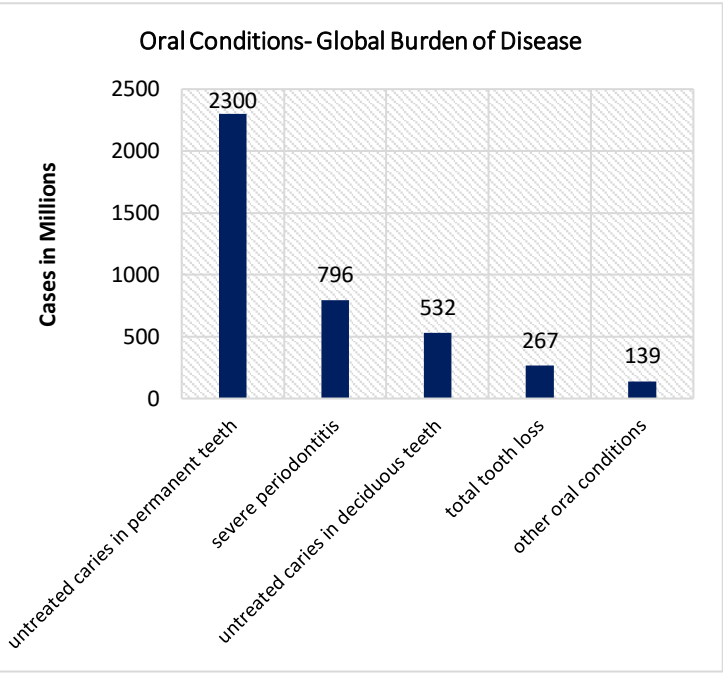
Global, Regional Trends in Burden of Oral Conditions

Oral health represents a major neglected challenge and health burden across the globe. The GBD study data and analytic tools provide a chance to evaluate progress toward oral health goals across all world geographies and over time in a comparable fashion. Data from the GBD study also offer the opportunity to identify countries achieving major success toward oral health goals, thereby helping to identify successful oral health strategies to reduce the burden of oral conditions. The GBD study also indicates the countries with the greatest needs for action and the health conditions causing the highest burden.

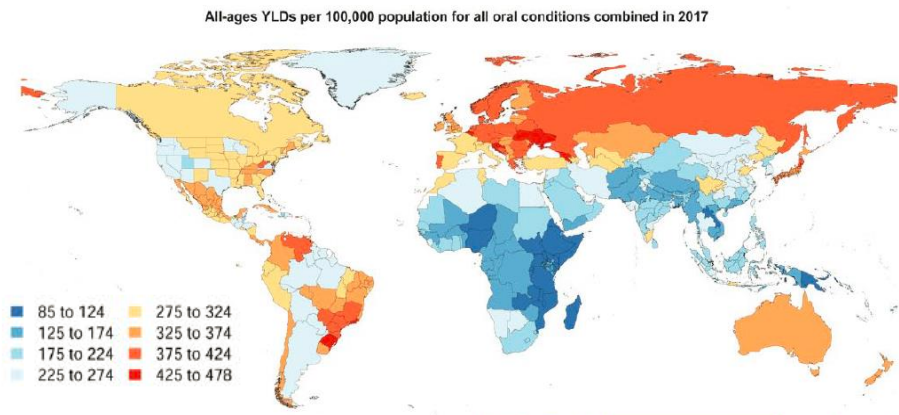
The aim of this component of the Global Burden of Disease study was to produce estimates on prevalence, incidence, and years lived with disability for oral conditions from 1990 to 2017 by sex, age, and countries. In addition, this study reports the global socioeconomic pattern in burden of oral conditions by the standard World Bank classification of economies as well as the Global Burden of Disease Socio-demographic Index.

Globally, there were 3.5 billion cases (95% uncertainty interval [95% UI], 3.2 to 3.7 billion) of oral conditions, of which 2.3 billion (95% UI, 2.1 to 2.5

The findings offer an opportunity to identify successful oral health strategies and strengthen them.



billion) had untreated caries in permanent teeth, 796 million (95% UI, 671 to 930 million) had severe periodontitis, 532 million (95% UI, 443 to 622 million) had untreated caries in deciduous teeth, 267 million (95% UI, 235 to 300 million) had total tooth loss, and



139 million (95% UI, 133 to 146 million) had other oral conditions. More economically developed countries had the lowest burden of untreated caries and severe periodontitis (measured in all-ages YLDs), they also had the greatest burden of tooth loss. The burden of dental caries in permanent teeth was highest in upper- and lower-middle income

countries. Furthermore, mouth cancers, congenital malformations (including orofacial clefts), and temporomandibular disorders were not included in this report.

Source: GBD study. *J Dent Res.* 2020;99(4):362–373

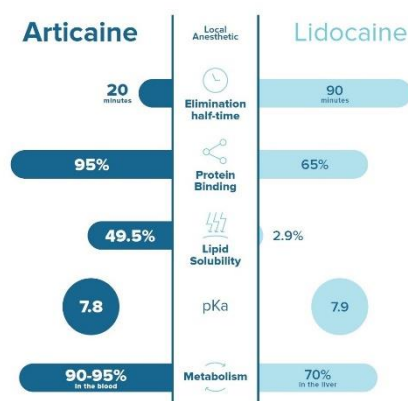
Efficacy and Safety of Articaine in Pediatric Practice

Pain control is a mandatory aspect in pediatric dentistry office through local anesthesia. This randomized study was conducted to assess the safety and efficacy of 4% articaine local anesthetic in young children below four-years-old. An equivalent randomized control trial with two parallel arms included 184 young children (92 per group) aged from 36 to 47 months seeking pulpotomy of mandibular primary molars which performed after buccal infiltration injection.

The control group has received lidocaine hydrochloride 2% with epinephrine 1:100000. The intervention was articaine hydrochloride 4% with epinephrine 1:100000. Children's behavior during injection and treatment have assessed using Faces, Legs, Activity, Cry and Consolability (FLACC) and child's behavior using Frankl Behaviour Rating Scale (FBRS). In addition, Postoperative complications have been addressed.

Both anesthetic agents were equivalent during the injection phase. During the treatment phase, the absolute risk difference (ARR) between the two groups was 0.120 (95% CI: -0.003; 0.243). The maximum limit of 95% CI surpassed the margin of equivalence, indicating that less pain has been expressed during pulpotomy among children delivered articaine when compared to their counterparts in the lidocaine group. Concerning postoperative complications, no statistically significant has been demonstrated between the two anesthetic drugs. The findings supported the efficient and secure use of articaine hydrochloride 4% with epinephrine 1:100,000 to treat children <4-years-old.

Articaine hydrochloride 4% with epinephrine 1:100,000 is effective and safe in children.



Source: Elheeny AAH et al. *Int J Paed Dent.* 2020. [online ahead of print] doi:10.1111/ipd.12640

Addition of Different Nanoparticles on Poly(methylmethacrylate) Denture Base Material

The study was conducted to evaluate and compare the surface properties (roughness and hardness) of poly(methylmethacrylate) (PMMA) denture base material modified with zirconium dioxide (ZNPs), silicon dioxide (SNPs), and diamond (DNPs) nanoparticles.

260 heat-polymerized acrylic resin discs (15 × 2mm) were prepared.

ZNPs, SNPs, and DNPs were added in concentrations of 0%, 0.5%, 1.0%, 2.5%, and 5.0% by weight of acrylic powder. This yielded a total of 13 groups for each test according to filler type and concentration (n = 10/group). The control group was made of pure acrylic. A mechanical polisher was used to standardize specimens' surfaces before testing. A profilometer and Vickers hardness indenter were used to test the surface roughness and hardness respectively. ANOVA and Tukey post hoc tests were used for data analysis ($\alpha = 0.05$). In comparison to control, results showed a non-significant increase in surface roughness (Ra) of acrylic material after the addition of 0.5% nanoparticles (ZNPs P =

0.168, SNPs P = 0.166 and DNPs P = 0.177), while a significant increase was seen with all other

concentrations (P<0.05). Ra values of ZNPs and DNPs groups were significantly higher than those of the SNPs group (P<0.001). The addition of any of the fillers to acrylic denture base materials significantly increased the hardness (P<0.05), with ZNPs and DNPs having values lower than those of the SNPs group (P<0.001).

Although nano-filler addition increased the hardness of denture base material, Ra was adversely affected when the concentration exceeded 0.5%. Therefore, 0.5% is suggested to be the most appropriate ratio to improve hardness with acceptable Ra.

Gad MM et al. *J Prosthodontics*. 2020 March 31. [online ahead of print]. doi.org/10.1111/jopr.13168

Nano-filler addition increased the hardness of denture base material.

